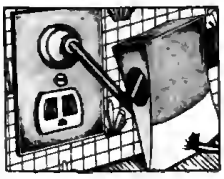
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

$2/COPY; $44/YEAR | JANUARY 26, 1987 | VOL. XXI, NO. 4

INSIDE



In Depth — Uninterruptible power supplies: How much are your DP operations worth? **Page 41.**

■ ■ ■

IRS places programmer tax change onus on brokerage firms. **Page 2.**

■

While hardware vendors report mixed results, software suppliers ride surging sales. **Page 94.**

■

Competing firms take common stand behind Unix standards at Uniforum '87. **Page 6.**

■

Amdahl rolls out entry-level Sierra challenger. **Page 12.**

■

Pay-for-support gains little support from Ashton-Tate customers. **Page 37.**

■

Tenants of a metropolitan office building learn varied lessons when fire hits the 42-story site. **Page 51.**

■

Hewlett-Packard aims to tie application-specific LANs to an X.25 packet-switched backbone and provide management tools to control them. **Page 10.**

■

A version of its Vines operating system for Intel 80386-based systems will debut from Banyan Systems by mid-year. **Page 15.**

■

The third release in 17 months of ADR's ideal offers a 25% performance boost. **Page 27.**

■

The latest Prime Series 50 mini is its highest performance office environment system yet. **Page 13.**

■

MS-DOS alternatives prepare to assault the 80386 market. **Page 14.**

DEC aims higher

Clustered VAXs target 3090 arena

By Alan Alper

NEW YORK — Digital Equipment Corp. last week extended its VAX family of computers to mainframe performance levels by unveiling two clustered configurations of its VAX 8700.

The two Vaxclusters consist of four and eight VAX 8700 processors, providing performance of 26 and 52 million instructions per second, respectively.

They are positioned to match the performance of IBM's high-end 3090 Models 200 and 400.

The Vaxclusters — named VAX 8974 and VAX 8978 — represent a renewed attempt by DEC to provide mainframe-level performance following the halt in development efforts three years ago of the Decsystem-20.

With the clusters, DEC introduced a disk subsystem offering 2.5G bytes of storage in a box occupying 5½ feet of floor space.

The company also showcased an ANSI-compatible structured query language implementation, software that manages distribution of relational data among multiple processors and enhancements to VAX DBMS and VAX RDB/VMS data base management systems.

Last week, analysts lauded DEC's move to extend its VAX clustering approach to the high end. DEC said it has already installed 5,000 Vaxclusters of lower performance machines.

"It gives them a nice way to pinpoint large accounts, which no doubt will help revenue and their profit margins," suggested Stephen Dube, an analyst with Shearson Lehman Brothers, Inc. in New York.

From a technology standpoint, however, some analysts said they expected more. "In reality, these systems don't run dyadically, and the disk subsystems still use conventional ferrite heads," noted Donald Haback, a vice-president of research with Nikko Securities Company International. "They have a long

See DEC page 8

Rebound at IBM seen hampered by CPU trends

By Clinton Wilder

ARMONK, N.Y. — After ending one of its worst sales years in a particularly dismal fashion, IBM faces major challenges to restore profit growth this year, according to analysts.

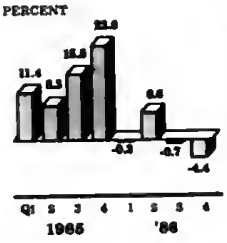
IBM said last week that its fourth-quarter earnings plunged 48% from year-earlier levels on a 1.2% decline in revenue. Although total 1986 sales increased by 2.4% to $51.25 billion, revenue from equipment sales dropped 0.4% from 1985 levels despite IBM's massive effort to convert its revenue stream from rentals to direct sales. It was the second consecutive year the company posted an annual decline in profits.

While many predict a second-half rebound based on reduced costs and new products such as the 9370 mid-range system, others suggest that IBM's traditional approach to the computer industry has created fundamental barriers to future success.

"The company's strategy and cost structure was built on an expected 30% to 40% annual increase in mainframe processing demand," said analyst Thomas Rooney of Donaldson, Lufkin & Jenrette, Inc.

IBM Revenue

Equipment sales change compared with year earlier



CW CHART

"More and more large users are pulling applications off the mainframe onto departmental and smaller systems, and that trend will con-

See IBM page 91

Overdue Apple server goes to market

By Patricia Keefe

CUPERTINO, Calif. — After almost two years of promises, Apple Computer, Inc. is expected this week to unveil Appleshare, an Apple-branded file server first announced 23 months ago.

The server, along with several Apple products and about 20 third-party Apple-oriented connectivity products, will be announced in San Francisco this week at The Seybold Conference on Desktop Communications.

Appleshare is a key part of Apple's connectivity strategy. It is actually a Macintosh Plus that features what sources say is "one of the better user interfaces to a sophisticated file server."

Released in conjunction with the server will be enhancements to Apple's user interface driver, Finder, that are said to provide support for a multiuser environment.

Apple eventually plans to incorporate a data base developed in France under the name Fourth Dimension and known at Apple as Silver Surfer, but the task was more complex than Apple thought, an Apple analyst said. "They want to include it eventually, but it's not ready," he added.

"The server is quite good; it will surprise a lot of people. Apple's got their act together this time," said an informed source familiar with Apple's plans.

In addition, Apple will announce PC Card, which will link IBM Personal Computers to an Appletalk network, allowing Macintoshes and IBM PCs to exchange files; Lasershare, a print spooler; DCA Filer, a card that links the Mac to Digital Communications Associates, Inc. files; and Apple Line 3270, which provides file transfer capability between the Mac and IBM 3270 environments.

In addition, the source said, products allowing Appletalk to run over Ethernet and fiber-optic cables will be unveiled.

The importance of these links lies in the integration of multiple environments — Apple, IBM and Unix — at the data and application levels.

Providing Appletalk links to Unix hosts and IBM-compatible micro-to-mainframe and 3270 environments will allow users to bring their Macintoshes in from the cold to function as part of the corporate DP system, whether operating in an IBM, multivendor or mixed-media environment.

"I think users will be very satisfied. They'll see [the Ap-

See APPLE page 7

3Com hit by merger fever again, woos Tops firm. Page 91

Users choke on Lotus copy scheme

By Peggy Watt

Many users of Lotus Development Corp. products are balking at the company's Extended Value Program, claiming the company's offer of non-copy-protected software requires them to function as piracy cops.

The Extended Value Program is part of an overall sales, training and distribution plan called the Multi-Value Plan.

A Lotus sales representative on the West Coast said at a Southern California corporate users group meeting that he has sold no contracts for Lotus's Multi-Value Plan, announced late last summer. While Lotus officials denied that was the case throughout the country, sign-up has apparently been sluggish.

Some managers complain that Lotus's proposal to "limit legal liability" of corpora-

See USERS page 4

NEWSPAPER

****
CU00697OS-2 C
UNIVERSITY MICROFILMS INTL
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

IRS qualifies tax section; placement firms impacted

By David A. Ludlum

WASHINGTON, D.C. — The Internal Revenue Service ruled last week that brokers and other firms that place technical workers in contract jobs may have to hire those individuals as full-time employees under a controversial section of last year's tax reform act.

The IRS said Section 1706 of the law applies to the relationship between a technical worker and an intermediary, such as a broker, that places the worker in jobs.

It does not apply to technical service employees who work under contract directly for the company for which they provide services. Many such companies have already terminated contracts with independent consultants and specialists because of uncertainty concerning the scope of Section 1706.

The law makes it more difficult for the workers placed by brokers to function as independent businessmen for tax purposes. It excludes them from so-called safe harbors existing in a 1978 law that, in effect, allowed most taxpayers who had been working as independent contractors to continue doing so.

Independents face burden

Technical service workers — computer programmers, systems analysts, engineers, designers, drafters, consultants and others — who work as independents through a broker now face the burden of proving that they function as independent businessmen rather than as employees of the broker.

As was the case before 1978, they must meet 20 common law standards that the IRS uses to determine who is an employee. The standards concern the degree of control an organization has over a worker, including where and during what time work is done, whose equipment is used and how the worker is paid.

Independent workers who become employees will have income and Social Security taxes withheld from their pay and will lose an array of tax advantages and the ability to fund their own relatively generous pension plans. Many independents have expressed outrage over losing the freedom they now enjoy.

One group organized to fight Section 1706, Technical Consultants National Association (Tecna), still plans to lobby for repeal of the measure, according to Frank Lynch, a Boston attorney working with the group.

The IRS is urging independents who will become employees to file W-4 forms with their new employers as soon as possible, because without one, the employer is required to withhold income taxes at the highest rate that could apply.

The IRS said it will waive penalties on employers for unpaid Social Security taxes due for the first quarter of this year if the taxes are paid by April 30 and for other Social Security taxes not paid for "reasonable cause."

Also, employers face no penalties for failing to deposit workers' income taxes or workers' shares of Social Security taxes with the IRS if those amounts were not withheld from the workers' pay. Employers, however, may ultimately be required to pay all the taxes due.

Sole group excluded from safe harbors

The technical service workers singled out by Section 1706 are the only occupational group to be excluded from the 1978 safe harbors.

The safe harbors were intended to be temporary, serving until Congress passed a law defining employee status, but Congress has yet to do so, said IRS spokesman Wilson Fadely.

Section 1706 was put forth by Sen. Daniel Patrick Moynihan (D-N.Y.) who, in response to the controversy over it, issued a brief statement saying it was designed "to ensure that technical services businesses that do business in the same way are subject to the same tax rules."

HP cuts price of Model 840

By James Connolly

PALO ALTO, Calif. — Hewlett-Packard Co., citing production economies, last week cut the price of its HP 9000 Model 840 technical system 28% only two months after the reduced instruction set computer (RISC) began shipment.

"It was always our plan to reduce the price of the Model 840 after we had enough experience manufacturing it to fine-tune the production process. It just didn't take us very long to get the system into volume production and start achieving cost savings from the lower parts count and faster assembly time," said Carl B. Flock, marketing manager for HP's technical computer operation.

The price cuts, which apply only in the U.S., brought the list price of a base configuration down from $113,500 to $81,500.

One industry analyst said the HP price cuts also appear to be a result of the market's changing during the time between announcement and delivery of the Model 840, which was announced last May, four months after HP introduced its first RISC-based HP 3000 general-purpose systems. Shipments of the first of those general-purpose systems, the HP Model 930, were postponed from late 1986 to the middle of this year.

Analyst William Rosser of the Gartner Group, Inc., a Stamford, Conn.-based market research firm, said, "Whenever you have a long period between announcement and delivery, you may have to cut prices shortly after delivery just to keep up with the competition. The rest of the world keeps moving along, and HP wants to keep showing the world, 'Hey, this thing is something special.'"

Rosser said similar price cuts are likely for the HP 3000 Model 930 and other products with long lead times.

In this issue

NEWS

Uniforum '87 vendors want standard, public-domain Unix environment/ 5

Unix operating system's security features to be improved/ 5

DEC announces enhanced version of Ultrix operating system/ 6

High-end configurations may not pursuade users to change their DEC/IBM data center mix/ 6

Avanti offers T1 switch to perform subrate digital multiplexing/ 10

HP unveils corporatewide networking solution backed by 13 products/ 10

Amdahl extends its IBM 3090-class mainframe line/ 12

Prime introduces high-performance office system/ 13

Ashton-Tate defends late shipment of Rapidfile/ 13

AT&T price cuts spur speculation on future releases/ 13

Firms ready 80386-based systems to rival delayed MS-DOS release/ 14

Cullinet outlines computer-aided design strategy/ 15

Banyan Systems to ship 80386-based enhancement of Vines 286/ 15

Ansa Software, Microrim announce support for Lotus' The Application Connection/ 91

3Com to acquire, ally with Tops developer/ 91

NETWORKING

Fibercom announces multiport transceiver for PC, terminal fiber-optic communications/ 23

Northern Telecom introduces uniform, building network wiring scheme/ 23

Comsat, ITT unveil satellite-based overseas connections service/ 23

SOFTWARE & SERVICES

ADR claims 25% performance boost in latest fourth-generation programming language release/ 27

Vendors' choice of X Windows as standard system offering receives mixed reactions/ 27

SYSTEMS & PERIPHERALS

Intel offers network server targeted at financial, governmental users/ 33

Storage Technology's tape subsystem offers Unisys 1100 compatibility/ 33

Amdahl's Multiple Domain Facility saves users time, money, space/ 33

MICROCOMPUTING

Cost, value of Ashton-Tate's corporate pay-for-support program disputed/ 37

Dbase users enhance systems with selection of adjunct products/ 37

MANAGEMENT

Belford Cross is taking care of DEC's MIS business/ 51

Fire in Boston's financial district alerts users to hazards, precautions/ 51

COMPUTER INDUSTRY

Third-party microcomputer software support gains corporate attention/ 67

Majority of hardware firms post strong fourth-quarter financial results/ 94

Enmasse Computer abandons manufacturing and sales operations/ 94

Quarterly earnings reports foreshadow healthy year for software, services industries/ 94

IN DEPTH

How much is enough? Deciding to buy an uninterruptible power supply is a gamble — and the safety of your system hardware and corporate data is at stake. By Alan Radding/ 41

OPINION & ANALYSIS

Ahl waits for the wind to be taken out of the pirates' sails/ 17

Ulrich and Horwitt reflect on a hectic networking period/ 23

Babcock reports on three styles of Cobol restructuring/ 27

Gibson investigates 'The Case of the Dastardly DASD'/ 33

Zachmann reviews Revolutionary Software's Cruise Control/ 37

Young explains the need to assess DP management style/ 51

Djurdjevic watches DEC take control of IBM's market share/ 94

DEPARTMENTS

Editorial/ 16

New Products/ 59

PAGE 17 ILLUSTRATION BY ALAN WITSCHONKE

800-343-6474

Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

Are you involved in an unusual application of DP technology in your company? Have you implemented successful cost-cutting strategies?

Is something in your DP shop not working as designed? Know any strung heroes? Heard juicy hot news about vendors?

Are you aware of technology or management trends the trade press is overlooking?

If so, we would like to hear from you.

Computerworld has established a reader hot line for information regarding items that are of interest to the computing community.

Call us—toll free at (800) 343-6474.

Ask for Computerworld's Hotline Editor.

We can't be everywhere — but our readers are.

DO YOU SPEND MORE TIME WAITING ON-LINE THAN YOU DO WORKING ON-LINE?

Hurry up and wait. Hit the enter key and you don't know when the computer will respond. So you just sit and wait. And wait. And wait.

Now this is the point where IBM will want to sell you a new computer. But, in most cases, you don't need bigger hardware. You need better software.

If you're an MVS shop that means ADR/ROSCOE®. A VSE or VM/CMS shop, ADR/VOLLIE®.

You see, ADR® software has to be better. We don't sell the hardware. So unlike their IBM counterparts, TSO and ICCF, ROSCOE and VOLLIE don't eat up your computer resources. Which is why they're able to give you significantly shorter response times.

For example, in a recent benchmark, as many as 40 ROSCOE users signed on at the same time and still got one second response times. But just 10 TSO users had to wait two seconds. And when the next 10 TSO users signed on, they had to wait as long as seven seconds.

But ROSCOE and VOLLIE do more than just help your computer work faster. They help you work faster, too.

When you work with ROSCOE and VOLLIE you have all commands available to you. All the time. So you can change functions without wasting time changing modes.

ROSCOE and VOLLIE also let you automate the programming process. You can store your typical program routines and recreate them with a single command. And you can design a screen and have the system create the code for you. Automatically.

Both ROSCOE and VOLLIE are invaluable programming tools. Simply because they give you more time for programming.

So if you're tired of waiting for your computer to respond, call 1-800-ADR-WARE. Or mail us the coupon.

ADR. WE KEEP WRITING THE HISTORY OF SOFTWARE.

Applied Data Research®, Orchard Road & Rt 206, CN-8, Princeton, NJ 08540 1-800-ADR-WARE. In NJ, 1-201-874-9000.

☐ Please send me more information about ADR/ROSCOE®
☐ Please send me more information about ADR/VOLLIE®
☐ Please have an ADR® Representative call

Name _____ Position _____
Company _____ Phone _____
Address _____
City _____ State _____ Zip _____
Computer Equipment _____ CN-1/26/87

© 1986 ADR

For information about ADR Seminars call 1-800-ADR-WARE.

IBM, MVS, VSE, VM/CMS, TSO and ICCF are trademarks of the International Business Machines Corp.

ADR

AN AMERITECH COMPANY

Users choke on copy scheme

From page 1

tions desiring non-copy-protected software actually boosts their liability.

They point to sections requiring a corporation to promptly investigate any allegations by Lotus that the firm's "employees, contractors or agents" are pirating Lotus products. Some managers object to Lotus's demand that corporations reimburse the vendor for each illicit copy made by an employee.

Under the Extended Value Program, users can qualify to receive a utility disk that removes copy protection from Lotus's 1-2-3 or Symphony.

Qualifications

In order to qualify, corporations must have at least 100 copies of the latest version of 1-2-3 or Symphony, have policies against software piracy and sign a contract with Lotus to ensure that the firm is notified by Lotus of the piracy.

Firms are liable for only the retail price of the number of copies illegally made.

"The wording of the document is something that no one in their right mind would sign," said a corporate acquisitions manager who asked not to be identified because he still hopes to negotiate a workable contract.

Todd Greeno, manager of office technology at Pfizer, Inc. in New York, is eager for unprotected versions of the more than 500 copies of Lotus programs in his office. But he said he "won't go to extremes" for the privilege.

"I want software publishers to make my job easier, with the understanding that our company strictly prohibits illegal copying. We educate our users and bring the issue to light frequently," he said.

The implication of guilt

Several managers said they strongly resented what they call an implication of guilt.

"No company should sign a contract for presettlement of transgressions that haven't happened," said Herbert Turner, systems analyst for Southern California Edison Co. in Rosemead, Calif. He handles site licensing and estimates the utility company has 2,000 copies of Lotus

"We have issued strong policies for three years," Turner said. "Ours even states violation could lead to termination. But we can only do so much in terms of training, reminding and disciplining." He said he wonders whether a company would have to pay Lotus if an employee sold illegal copies of the company software.

Some managers said their colleagues are nit-picking.

"The spirit of the agreement limits liability to copying on the business premises," said Robert Corr, director of technical services for Pacific Operations with Electronic Data Systems Corp.

"I think you're stretching it a bit to say a company is liable for an employee's action off the premises of the company and without the consent of the company. That employee would have committed several other crimes, including theft of company property and copyright theft," Corr observed.

His objection is to the continued inconvenience even of unprotected software under Lotus's plan.

"They won't give you an un-copy-protected disk," he said. "They give the user a utility to remove the copy protection. That imposes a cost and burden on corporations to go through these rather cumbersome procedures. It would be much easier if they just shipped un-copy-protected software," Corr said.

Lotus replied that its rules are simple.

"What's required is a policy in place against illicit copying and a set of procedures to address violations as an internal matter," said Mike Kolowich, vice-president of marketing and business development.

He said Lotus does not ask to be notified of violations discovered and handled by the customer company, but if Lotus refers a complaint to the user, the vendor wants a report of the results.

"We don't want to interfere, but where we remove physical barriers to our software, we want the company to do its work in making it known to employees that illegal copying is tantamount to theft of company policy," Kolowich said.

Still, a lot of corporate attorneys are taking a close look at the contract.

"Lately, anything that even looks like software provisions, I send to my attorney," said Joe Nixon, software acquisitions officer of the information services for the Commonwealth of Pennsylvania at Harrisburg. He said he faces the added ethical concerns of a governmental agency.

"You are expected to be above reproach," he said. There is no stated antipiracy policy, "but it's against the law, so we don't do it."

The acquisitions officer for a major defense contractor with more than 400 copies of Lotus products said the company's legal department advised against signing the contract.

The troubling provision requires a licensee to monitor its employees, contractors or agents in allegations of illegal copying.

Any U.S. Department of Defense contractor has too many subcontractors to accept that responsibility, the legal department reportedly said.

Inconvenience over liability

"We're concerned about the legal risk of agreeing to investigate allegations made by Lotus and to present findings to them," the acquisitions officer said. "That put us up for a potential lawsuit from an employee." The company chose the inconvenience of copy protection over what it perceived as increased liability.

Lotus's Kolowich said the provisions are being misinterpreted.

"We're not asking for people or evidence to be turned over to us, we're just asking to be paid back at the retail price," Kolowich said.

He said, however, that Lotus is still open to individual negotiations, and several customers expect revisions.

"I really look at this as being a trial balloon," said Southern California Edison's Turner. "And I think this one was a failure. They want feedback from us as to what they are willing to buy."

EDS's Corr said he expects Lotus to succumb to pressure and eventually drop copy protection entirely.

"It's a vendor's right to impose any terms they can. Our alternative is not to buy the product," Nixon said. "Until users get tired of these kind of contracts and dig in their heels, there won't be changes," he concluded.

Federal agencies gain 1-2-3 access

CAMBRIDGE, Mass. — While corporate users debated the merits of Lotus Development Corp.'s plan for the removal of copy protection, government users last week gained access to a nonprotected version of 1-2-3.

Many government agencies have policies against purchasing software that includes copy protection, and Lotus has lost sales as a result.

The version of 1-2-3 Release 2.01 for the federal government has no copy protection. Instead, the package has an initial screen that reads "Property of the U.S. Federal Government" and provides regulations against unauthorized duplication. Like the earlier release of 1-2-3, the package has a suggested price of $495.

A government version of Lotus's Symphony will be available later this year, according to the company.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN-0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (6 issues), April (5 issues), May (6 issues), June (6 issues), July (5 issues), August (6 issues), September (5 issues), October (5 issues), November (6 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Copyright 1987 by CW Communications/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. ‡

Special requests for reprints and permission should be addressed to Nancy M. Shannon, CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Subscriptions call toll free (800) 544-3712 or (215) 768-0388 in Pennsylvania.

Subscription rates: $2.00 a copy; U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

ABP

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, Circulation Department, P.O. Box 1016, Southeastern, PA 19398-9984.

COMPUTERWORLD

Editor in Chief
Bill Laberis

Executive Editor
Paul Gillin

News Director
Peter Bartolik

Senior Editors
James Connolly, Systems
Clinton Wilder, Industry
Elisabeth Horwitt, Networking
Charles Babcock, Software
David Ludlum, Management
Douglas Barney, Microcomputing
Patricia Keefe, Networking

Senior Writers
Donna Raimondi, Rosemary Hamilton
Stanley Gibson, David Bright
Ninamary Buba Maginnis

New Products Editor
Suzanne Weixel

Features Director
George Harrar

Senior Editors
Janet Fiderio
Glenn Rifkin
Joanne Kelleher

Associate Editor
Amy Sommerfeld Fiore
Deborah Fickling, Penny Janzen

Assistant Editor
Kelly Shea

Senior Writer
Michael L. Sullivan Trainor

Researcher
Sally Cusack

Managing Editor
Donovan White

Chief Copy Editor
Patricia Heal Erickson

Assistant Chief Copy Editor
Steven M. Uffelder

Copy Editors
Susan Miller, David W. Bromley
Mary Grover, Martha E. Ruch
Sharon Baker, Laura O'Connell

Design Editor
Marjorie Magowan

Graphics Editor
Mitchell J. Hayes

Graphic Designer
P. Charles Ladouceur

Assistant to the Editor in Chief
Parth Domke

Editorial Assistants
Patricia Faherty, Christie Sears
Linda Gorgone, Bonnie MacKei

Rights and Permissions Manager
Nancy Shannon

News Bureaus

Mid-Atlantic
201/967-1350
Alan Alper, Correspondent

Washington, D.C.
202/347-6718
Mitch Betts, Correspondent

Southeast
404/394-0758
James A. Martin, Correspondent

West Coast
415/424-8844
Jeffry Beeler, Chief
Peggy Watt, Correspondent

Midwest
312/827-4433
Jean Bozman, Correspondent

CW Communications International News Service
Susan Blakeney, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171 617/879-0700

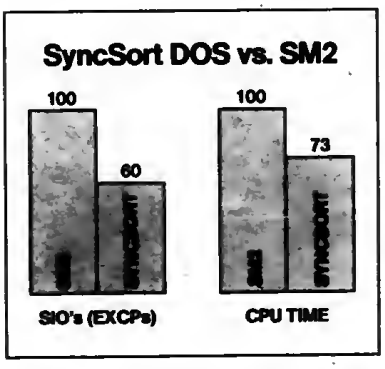
Computerworld is a member of the CW Communications Inc group, the world's largest publisher of computer related information. The group publishes over 70 computer publications in more than 28 major countries. Twelve million people read one or more of the group's publications each month. Members of the CWCI group contribute to the CW International News Service offering the latest on domestic and international computer news. Members of the group include: ARGENTINA'S *Computerworld Argentina, PC Mundo*; ASIA'S *Asian Computerworld, Communications World*; AUSTRALIA'S *Computerworld Australia, Communications World, Australian PC World, Australian Macworld*; AUSTRIA'S *Computerwelt Oesterreich*; BRAZIL'S *DataNews, PC Mundo*; CHILE'S *Informatica, Computacion Personal*; DENMARK'S *Computerworld Danmark, PC World Danmark, RUN*; FINLAND'S *Tietoviikko, Mikro*; FRANCE'S *Le Monde Informatique, Distributique, Golden, InfoPC, Theoreme*; GREECE'S *Micro and Computer Age*; HUNGARY'S *SZT Computerworld, Mikrovilag*; INDIA'S *Dataquest*; ISRAEL'S *People & Computers Monthly, People & Computers Weekly*; ITALY'S *Computerworld Italia, PC World Magazine*; JAPAN'S *Computerworld Japan*; MEXICO'S *Computerworld Mexico*; THE NETHERLAND'S *Computerworld Netherlands, PC World Netherlands*; NEW ZEALAND'S *Computerworld New Zealand*; NORWAY'S *PC Mikrodata, Computerworld Norge*; PEOPLE'S REPUBLIC OF CHINA'S *China Computerworld*; SAUDI ARABIA'S *Arabian Computer News*; SOUTH KOREA'S *The Electronic Times*; SPAIN'S *Computerworld Espana, Commodore World, PC World Espana*; SWEDEN'S *Computer Sweden, Mikrodatorn, Svenska PC World*; SWITZERLAND'S *Computerworld Schweiz*; UNITED KINGDOM'S *Computer News, DEC Today, ICL Today, PC Business World*; UNITED STATES: *Amiga World, Boston Computer News, Computerworld, Digital News, 80 Micro, FOCUS Publications, inCider, InfoWorld, MacWorld, Micro Marketworld, Network World, PC World, Publish!, RUN*; VENEZUELA'S *Computerworld Venezuela*; WEST GERMANY'S *Computerwoche, PC Welt, Computer Business, Run, InfoWelt*

SMART COOKIE

Like you, SyncSort DOS is cut from a special mold.

Call (201) 930-9700.

It's healthy for your system.



One thing about smart cookies, they can spot each other a mile away.

While they don't flaunt their derring-do, they quietly know they're the best at what they do. Because substance shows through. Every time.

Especially when the going gets tough. And rough. As it often does in a DOS environment.

For example, a smart cookie doesn't crumble under the pressure of too many programs and too few programmers.

A smart cookie doesn't waste dough — but picks and chooses the right ingredient to keep production on the rise.

And sometimes, even, a smart cookie has to be a mighty tough cookie. That means being on the job constantly. Keeping things running and humming. Without draining vital resources.

All of which brings us to our smart cookie: SyncSort DOS. A cut above the rest if you ever saw one. Check these delicious advantages.

BETTER PERFORMANCE

Pop one into your system and you'll see a mouthwatering difference. Immediately. SyncSort DOS will give you performance improvements like those shown in the chart on the left.

And performance features such as:

- **Automatic Secondary Allocation** — With this feature your sorts will never run out of disk space, i.e., no "sort capacity exceeded" messages.

BETTER FEATURES TO IMPROVE PROGRAMMER PRODUCTIVITY

As you begin to digest SyncSort DOS, you'll find it more and more to your liking. With ingredients that cut down to size the amount of programming time going into applications.

- **SortWriter** — A powerful tool that can produce extensive reports as a by-product of your normal sorting — without user exits and the associated programmer investment. Headers, trailers, total and sub-total capabilities provide flexible formatting
- **Record Formatting** — Powerful features like INCLUDE/OMIT, INREC/OUTREC, SUM and others — with capabilities like data conversion, editing, insertion of literals.
- **Multiple Output** — From a single sorted file, you can create multiple files and reports. Each can include the same or different data as determined by INCLUDE, OMIT, OUTFIL or OUTREC parameters.

BETTER CUSTOMER SERVICE

Still another sweet advantage of SyncSort DOS: help is always there when you need it. 85% of all requests for service are resolved within 24 hours. We always rise to the occasion.

The moral to this story: smart cookies are quick to reject half-baked solutions in favor of SyncSort DOS. Call us for a demonstration. Once you get a taste you will be hungry for more.

SyncSort DOS
One smart cookie deserves another.

syncsort INC.

Syncsort Incorporated 50 Tice Boulevard, CN18, Woodcliff Lake, N.J. 07675

Vendors pull together to boost Unix standards

Firms at Uniforum willing to cooperate

By Elisabeth Horwitt

WASHINGTON, D.C. — Exhibitors at Uniforum 1987, The International Conference of Uoix Users, demonstrated that they are willing to surrender market dominance based on proprietary products in favor of a standardized, public-domain Unix environment.

"People are finally realizing that they've got to blow competition away oo some other issue than interoperability," commented Daniel Lynch, president of Cupertino, Calif., consulting company Advanced Computing Environments.

One major thrust behind the standards is vendors' realization that a fragmented Unix cannot effectively compete in the mid-range system arena against emerging proprietary products from the likes of Digital Equipment Corp. and IBM, according to Geoff Morris, chairman of Unix vendor consortium X/Open.

"Unix vendors want to provide a standardized, mid-range solution before the big-system vendors finish moving their proprietary solntions down and shut off that market," Morris said.

Support for Unix standards

During the conference held here last week, companies gave at least verbal support to emerging Unix standards that eventually will enable customers to port applications across a variety of Unix-based hardware.

Perhaps more significant was the growing number of companies willing to cooperate with competitors — or even adopt a competing product — in order to hasten commercial availability of the multivendor programming and networking products their customers demand.

One Uniforum '87 announcement exemplifying the new spirit of cooperation was made by sometime competitors Microsoft Corp. and Interactive Systems Corp.

The two companies will jointly develop and market a Unix-based operating system for the Intel Corp. 80386 microprocessor as well as a version of Microsoft Xenix System V that incorporates the functionality of AT&T's Unix System V.3. "It makes sense for us to work together rather than fragment Unix," noted Microsoft Xenix general manager Paul Maritz.

Even AT&T has announced plans to merge its Unix System V with Portable Operating System Environment (Posix), an open industry standard currently being developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE).

At a press conference held last Tuesday, AT&T spokesman William O'Shea reiterated AT&T's endorsement of Posix and the company's intentions to conform to the standard.

An IBM spokesman voiced that company's intention of supporting the standard, "once it is signed off."

However, industry representatives questioned the significance of vocal industry support of a standard that is still very much in its embryonic stage. The initial Posix module, 1003.1, just specifies operating system calls based primarily on System V, with a few from Berkeley Unix, according to DEC Ultrix technical engineer Glenn Johnson, referring to Unix Version 4.2 from University of California at Berkeley. The real obstacles, he added, will occur when IEEE starts working on Posix 1003.2, which incorporates a standardized user shell.

"Posix is great for application portability — we just wish there were more of it," said a Uniforum '87 attendee from the government sector. "It seems like, so far, they only have a small piece of what is needed."

But there remains the question of how to standardize around higher level functions such as the networking interface and distributed file system.

It might take IEEE years to develop such protocols from scratch, but the market will not wait for such action. Instead, some vendors have adopted as de facto standards already-existing commercial products that perform the functions mentioned above.

A growing number of products incorporate Streams, AT&T's specifications for interfacing a networking environment, with Unix System V.3's networking interface, Transport Level Interface. Both Convergent Technologies, Inc. and Wollongong Group, Inc. demonstrated Streams-compatible interfaces between Unix V.3 systems and Transmission Control Protocol/Internet Protocol networks.

While AT&T appeared to be gaining ground with Streams, the vendor's distributed file system Remote File System (RFS) lost some ground at Uniforum '87 to the emerging de facto standard, Network File System (NFS) from Sun Microsystems, Inc. AT&T and Sun's archrival, Apollo Computer, Inc., announced at Uniforum that both would support NFS.

Also during Uniforum '87, AT&T announced that it had joined X/Open, which has published a Portability Guide specifying a Common Applications Environment for Unix. X/Open's membership now consists of 11 hardware vendors including DEC, Hewlett-Packard Co., Unisys Corp. and seven European manufacturers.

X/Open members are committed to implementing the Common Applications Environment on their Unix systems by the third quarter, according to Morris.

Software issues

On the software side, however, conflict is brewing due to X/Open's decision to incorporate into its standard certain protocols that already exist in proprietary commercial products.

The environment's incorporation of IBM's SQL facilitates interfaces with SQL-based data base management system products from Relational Technology, Inc., Informix Software, Inc., Oracle Corp. and Unify Corp., according to Morris. However, three out of four of the above products may have trouble interfacing with one component of the environment, C-indexed sequential access method (C-ISAM), a method for managing indexed files that was developed by Informix.

According to Oracle spokesman Michael Wallace, the use of C-ISAM, a proprietary protocol, in an industry standard "seems funny and may make competitors shy away."

DEC wraps Ultrix around entire VAX line

By Mitch Betts

WASHINGTON, D.C. — Digital Equipment Corp., in an announcement made here last week at Uniforum 1987, The International Conference of Unix Users, unveiled a version of its Ultrix operating system that includes significant enhancements and spreads Unix throughout the popular VAX family.

According to analysts at International Data Corp., a market research firm in Framingham, Mass., DEC wants to sell more mid-range systems to the federal government and the automotive and aerospace industries, which are heavy users of Unix.

In addition to running on all VAX machines, from the Microvax II to the VAX 8000 systems, Version 2.0 of Ultrix-32 includes a VAX C/Ultrix compiler said to decrease execution times for C-based programs.

Roger Heinen Jr., a DEC software engineer, said the C compiler is intended for "customers who desire to extract the utmost performance from their VAX hardware." He added that the product announcement reflects the fact that DEC is tired of losing application benchmark tests to other hardware vendors due to its earlier compiler technology.

The vendor said Version 2.0 also incorporates Network File System support, an implementation of the popular file sharing feature developed by Sun Microsystems, Inc.

In addition, Heinen said, the new version adds features that align Ultrix, which is based on the University of California at Berkeley Unix Version 4.2, with other industry standards, including AT&T's System V Interface Definition and the IEEE 1003 specification.

Also announced at Uniforum was Version 2.0 of Decnet/Ultrix, a networking software product that allows Ultrix users to link their systems to DEC's other software systems.

The vendor said it also includes a gateway between Decnet networks and Internet networks based on the Transmission Control Protocol/Internet Protocol.

The price of Ultrix-32 Version 2.0 ranges from $4,000 for eight users on the Microvax II to $70,000 on the VAX 8800. The C compiler is bundled with Version 2.0 at no additional charge. The price of Decnet/Ultrix Version 2.0 ranges from $600 for the Vaxstation II/GPX to $7,965 for the VAX 8800.

Unix groups, AT&T plan to plug holes

By Mitch Betts

WASHINGTON, D.C. — Two Unix industry groups and AT&T announced last week that they will take steps to improve the security features of the Unix operating system, which security experts say is notorious for being "full of security holes."

Various efforts to improve Unix security were aired at a well-attended panel discussion at Uniforum 1987, The International Conference of Unix Users, held here last week. Panelists said the openness and flexibility that made Unix popular in the research community make it less than secure, particularly for use in sensitive government applications.

If computer security is defined as the controlled sharing of data, said Skip Egdorf, a member of the computer security group at Los Alamos National Laboratory in New Mexico, then "Unix is all sharing and no control." Security features of Unix have improved since it first emerged from the research community, he said, but it still has far to go.

One attempt at beefing up Unix security will be handled by the X/Open Security Working Group, a panel of the X/Open international consortium of computer vendors. Iveta Trautmanis, program development manager at Unisys Corp. and chairwoman of the working group, said the panel will first identify the security needs and then develop standards. Unisys is the partnership of former Burroughs Corp. and Sperry Corp. Trautmanis said the goal is to meet the security standards of the U.S. government's National Computer Security Center and the requirements of European privacy and data integrity laws.

Similarly, /Usr/Group, an international association of Unix vendors and users, has a new security subcommittee that intends to submit draft security standards to standards organizations, according to subcommittee Chairman Steve Sutton, a computer security consultant with Addamax Corp. in Champaign, Ill.

"Unless we standardize on security interfaces, we will run into problems with the interchange of data between systems with different security policies," said Steven M. Kramer, vice-president of research and development at Secureware, Inc. in Atlanta.

Lisa A. Kennedy, a systems engineer at AT&T in Summit, N.J., said that although AT&T's Unix System V has some basic security features, such as user identification, passwords and discretionary access controls, some customers require more rigorous security.

For example, she said, customers are demanding more extensive audit facilities, mandatory access controls and certification by the National Computer Security Center. Kennedy said AT&T plans, in future versions of Unix, to enhance the existing security capabilities, seek government certification of System V and work with the various standards-setting groups to improve Unix security.

Apple server goes to market

From page 1

ple announcements] as a serious offering," the source added.

Also expected at the conference this week is the announcement of a diskless workstation from 3Com Corp. in Santa Clara, Calif. 3Com is said to have a high-end IBM PC AT-compatible diskless workstation featuring an Enhanced Graphics Adapter, 3Com's network interface and the Lotus/Intel/Microsoft Expanded Memory Specification up to 1M byte. "It has everything except the disk and monitor," a 3Com dealer said. The product is targeted at data base applications and those in which there are security considerations.

Novell, Inc. in Orem, Utah, 3Com's local-area network rival, currently offers a low-end diskless workstation for $700. Its purpose is to lower the cost of adding more nodes to a network.

The dealer was told 3Com's diskless product would cost about $2,000. "Under $1,500 seems to be the price range more acceptable to the market," said Claire Fleig, research director for the International Technology Group in Los Altos, Calif.

Mac-compatible 3+

3Com will also make an announcement concerning its promised Macintosh-compatible version of its 3+ network software. The product has been in beta test for several months but will have to undergo changes to make it compatible with Centram Systems West, Inc.'s Tops network operating system, said Robert Bressier, vice-president and general manager of 3Com's software division (see related story page 91).

In a separate announcement last week, 3Com said it has signed a letter of intent to purchase Centram (see story page 91).

Meanwhile, Novell is also working on Mac-compatible network software. Informed sources said Novell initially was going to launch Macnetware at the Seybold show but is not ready because it has once again run into difficulties with Apple. This is Novell's second attempt — announced at Novell's Networld trade show in October — to port Netware to the Mac environment.

An earlier attempt was abandoned by frustrated Novell officials faced with minimal cooperation from Apple. A source close to both companies said Novell has run into the same problems, but a Novell source said both companies are committed to the project. "It's just that Apple needs to clarify its networking protocols, like the interface for the operating system and the device driver."

Despite the wealth of Apple communications-related announcements at Seybold, users should not expect to see all the missing pieces of Apple's connectivity strategy. "They may see the beginnings of that strategy," International Technology Group's Fleig said, adding that the rest of the picture should unfold during this year.

"Apple is in a good position as far as its presence in the market," Fleig said. Apple has completed its turnaround phase and now has the opportunity to move forward — as opposed to last year, when it was struggling and racked with rumors, she added. "Business people are looking at Apple's products, which will give Apple a little more time to bring its strategy together than it might have had 48 months ago."

Less clear is the impact Appleshare will have on the third-party Apple file server market.

"I'd be concerned if I were 3Com or any vendor whose claim to fame is linking the Apple and IBM worlds," one source close to Apple and 3Com said. 3Com has a file server with a built-in Appletalk connector and sells products linking the Mac to the IBM world.

Third-party vendors with low-end file servers lacking the feature richness of Appleshare will probably do fairly well, the source said.

"I think there is still a need for several people to provide file servers," Fleig said.

Fowler resigns after serving six years as FCC chairman

By Mitch Betts

WASHINGTON, D.C. — Mark S. Fowler, chairman of the Federal Communications Commission for the past six years, recently announced he will leave the FCC this spring. His successor is likely to be another ardent supporter of communications deregulation.

The favorite candidate to replace Fowler as chairman is Commissioner Dennis Patrick, who is leading the effort to further deregulate AT&T. Another contender is Commissioner Mimi Weyforth Dawson.

Fowler has expressed interest in becoming an entrepreneur rather than an industry lobbyist when he leaves the FCC.

He announced his resignation shortly before he was to face a bruising round of reconfirmation hearings in the Democrat-controlled U.S. Senate.

A Republican who has called himself "Mr. Deregulation," Fowler has in recent years encouraged the commission to reduce regulatory constraints on the seven regional holding companies so they could offer more services to business and residential customers.

FAST DUMP RESTORE

THE 5th GENERATION

DASD MANAGEMENT SYSTEM

1987 USER RATINGS*
Based on Scale 1-10
10 = Excellent and 1 = Poor

Reliability	9.62	Ease of Installation	9.42
Efficiency	9.40	Ease of Use	8.65

OVERALL SATISFACTION 9.50

*1987 Datapro Research Corporation

COST—ABR is $9,500 (perpetual license for one CPU) for existing FDR/COMPAKTOR customers. Non-FDR/COMPAKTOR customers, total cost is $17,500 (perpetual license).

Compare for yourself—If you are considering a DASD Management System, or already have one installed, let us send you a comparison based on cost, performance and features.

The Fastest DASD Management System...

For a FREE 90 Day No Obligation Trial Call or Write:

INNOVATION DATA PROCESSING
970 Clifton Avenue, Clifton, NJ 07013•201—777-1940

Available for IBM VS1, MVS and MVS/XA systems.

User doubts face DEC's bid to capture data center from IBM

By James Connolly

While Digital Equipment Corp. apparently wants to steal market share from IBM in the large corporate data center, users reported last week that the introductions of the VAX 8974 and VAX 8978 are unlikely to have an immediate impact on IBM installations in their companies.

Immediate customer reaction to the announcement was less than enthusiastic, as managers in companies that run DEC equipment or combinations of DEC and IBM systems wondered whether the four- and eight-CPU configurations will address their specific needs.

The customers expressed greater interest in the simultaneous announcement of the 2.4G-byte SA482 disk subsystem, which they see as a replacement for existing DEC RA81-based 456M-byte disk systems.

The key question raised about the high-end VAX systems was whether the performance will meet DEC's claims. The vendor said the 8974 offers 20 to 25 times the power of a VAX-11/780 and that the 8978 is up to 50 times more powerful than the 11/780.

Competing with 3090

Since the 11/780 has been generally rated at 1 million instructions per second (MIPS), DEC's claims placing the 8974 in the range of 20 to 25 MIPS and the 8978 at up to 50 MIPS make the machines appear to be competitive with IBM's high-end 3090 Model 200 and Model 400 mainframes.

Errol Sandler, director of scientific management information systems at G. D. Searle & Co. in Chicago, noted that the image the new configurations offer to applications and users will determine their power.

"I've been beating the bushes to find out what it is all about. I want to know whether it is in effect a single processor or a VAX 8800-style master-slave machine," said Sandler, whose company runs research and development on VAX 8600s and VAX 8650s and general business operations on IBM hosts. He said Searle officials have talked to other vendors about using non-IBM equipment for general data processing but that the DP operation remains heavily IBM.

However, Sandler said he has been waiting for the higher capacity disk drives largely because he hopes the new drives will be more reliable than the RA81 and will reduce the number of drives needed to support his data storage requirements.

Another manager who said he is wary of the performance claims is Angelo Privetera, director of information systems for Ball Aerospace in Boulder, Colo.

"I would need to actually benchmark the systems. I still think that in a business environment with a variety of applications, you need to benchmark each system based on your own environment," Privetera said. Ball uses VAXs to support scientific and engineering users and to handle general business applications relating to those users. Ball runs most business and financial applications on IBM mainframes.

Privetera noted that while DEC has received national attention for trying to drive into IBM's data center market, he has seen a greater attempt by IBM to push into DEC's traditional markets in science and engineering.

'Above what we need'

Another manager questioned about the announcements said he is unlikely to move up to the 8974 and 8978. Roy E. Johnson, information systems director for Grinnell Mutual Reinsurance Co. in Grinnell, Iowa, said, "From what I can tell, they are above what we need." Johnson's firm runs its own insurance software on seven VAXs.

However, Johnson said he has noticed a DEC penetration into IBM's market share in other insurance firms.

Johnson also said a shift to the larger disk subsystem is unlikely since his company has excess capacity on its RA81s.

DEC aims high

From page 1

way to go to catch IBM."

Grant Saviers, DEC vice-president of storage systems, said a subsystem — the SA482 — would be the last generation of DEC large-scale storage products to use ferrite heads. IBM uses thin-film heads on its high-end 3380 direct-access storage device, which has enabled it to provide 2.5G bytes of storage per actuator.

Aimed at the data centers of large commercial and scientific corporations, the clustered systems are designed to handle traditional mainframe applications such as accounting, electronic funds transfer, management of large data bases, data processing and research and development, the Maynard, Mass.-based firm said.

The multiprocessor systems do not perform parallel processing but operate as independent processors, the firm added.

Although the systems seemed aimed directly at IBM's large system market, the company downplayed any confrontational intentions. "The strategy is not specifically to replace IBM systems, since people have made significant hardware investments, but to allow VAX/VMS systems to gracefully coexist with IBM," said Rose Ann Giordano, DEC vice-president of consultant and information marketing.

DEC approach applauded

Yet Thomas Nies, chairman and founder of Cincom Systems, Inc., whose firm markets software to IBM mainframe and VAX users, said his customers feel DEC is taking a better approach to computing, particularly in production environments. He said it is not a question of how many MIPS a system offers but how much power is provided for applications processing after accounting for systems software.

"DEC delivers more MIPS," he said, noting that 85% of the MIPS offered on the new Vaxclusters are usable for applications processing, compared with only 60% on the high-end IBM 3090s.

With the Vaxclusters, DEC is offering a one-year hardware warranty, one-year software support and a resident systems engineer to help tailor application development to business needs.

The four-processor VAX 8974 comes standard with 128M bytes of main memory, expandable to 512M bytes; the new SA482 2.5G-byte storage subsystem; dual HSC70 controllers; a TA78 dual-density tape drive; a Decserver handling up to 200 terminals; a Vaxcluster Console system, consisting of a Microvax II, Ethernet networking capability and VMS and Decnet software licenses; and a VAX Performance Advisor software license. Up to 16 8700 processors can be clustered, DEC said.

The eight-processor VAX 8978 comes with 256M bytes of main memory, expandable to 1G byte, two storage subsystems, four I/O controllers, two dual-density tape drives and two Decservers, handling 400 terminals. Up to 32 8700 processors can be clustered, the firm said.

Big systems arena

DEC's target market and starting point

Systems	Units (installed base)
[illegible]	[illegible]
IBM 3090	773
[illegible]	[illegible]
DEC VAX 8600/8650	2,640
[illegible]	[illegible]

INFORMATION PROVIDED BY COMPUTER INTELLIGENCE, 1986.

By purchasing the multiprocessor packages, which include disk and tape storage, operating systems and networking software licenses, customers will spend between 10% and 15% less than if they purchased the components separately, analysts said. Available 90 days after receipt of order, the VAX 8974 is priced at $2.6 million, while the VAX 8978 lists for $4.7 million, the firm said.

Each processor in the system can be upgraded to the VAX 8800, although DEC did not provide pricing or availability schedules.

The new SA482 storage array consists of four head-disk actuators providing 2.5G bytes of storage, 36% more storage than previous DEC products. Each HSC70 I/O controller supports eight data channels and can accommodate up to 20G bytes of on-line storage.

While the new SA482/HSC70 subsystem is an integral part of the new Vaxclusters, it can also be used with other VAX and PDP-11 systems because it conforms to Digital Storage Architecture and Standard Disk Interconnect. Available immediately, the SA482 lists for $84,000.

DEC's ANSI-compatible SQL — VAX SQL — is a software development tool to be used with VAX RDB/VMS relational data base management systems and VIDA VAX-to-IBM Data Access product. It can be used with local and remote data bases and is available immediately for a licensing fee of $1,770.

Enhanced VAX DBMS

DEC has enhanced VAX DBMS and RDB/VMS for use with VAX SQL. DBMS Version 3.2 is said to run twice as fast as earlier versions and to more easily restucture data bases.

In addition to offering an SQL interface, RDB/VMS Version 2.2 now has a VAX C compiler and support for distributed data base management capabilities through another new software package called the VAX Data Distributor.

Data Distributor manages the automated distribution of relational data among multiple processors running the VAX/VMS operating system. It will begin shipping next month and is priced at $1,800 for the Vaxstation II workstation to $27,000 on the VAX 8800.

VAX Performance Advisor, performance analysis software for single and multiprocessor VAXs running the VMS operating system, is currently available. Licenses begin at $5,500, the firm said.

Send for Smarter Data Entry

Entrypoint* will turn your PCs into a powerful distributed data entry system, with a dramatic increase in productivity. Entrypoint's intelligent editing ensures clean data. See why hundreds of companies have switched to the market leader

Name _____ Title _____

Company _____ Phone _____

Address _____

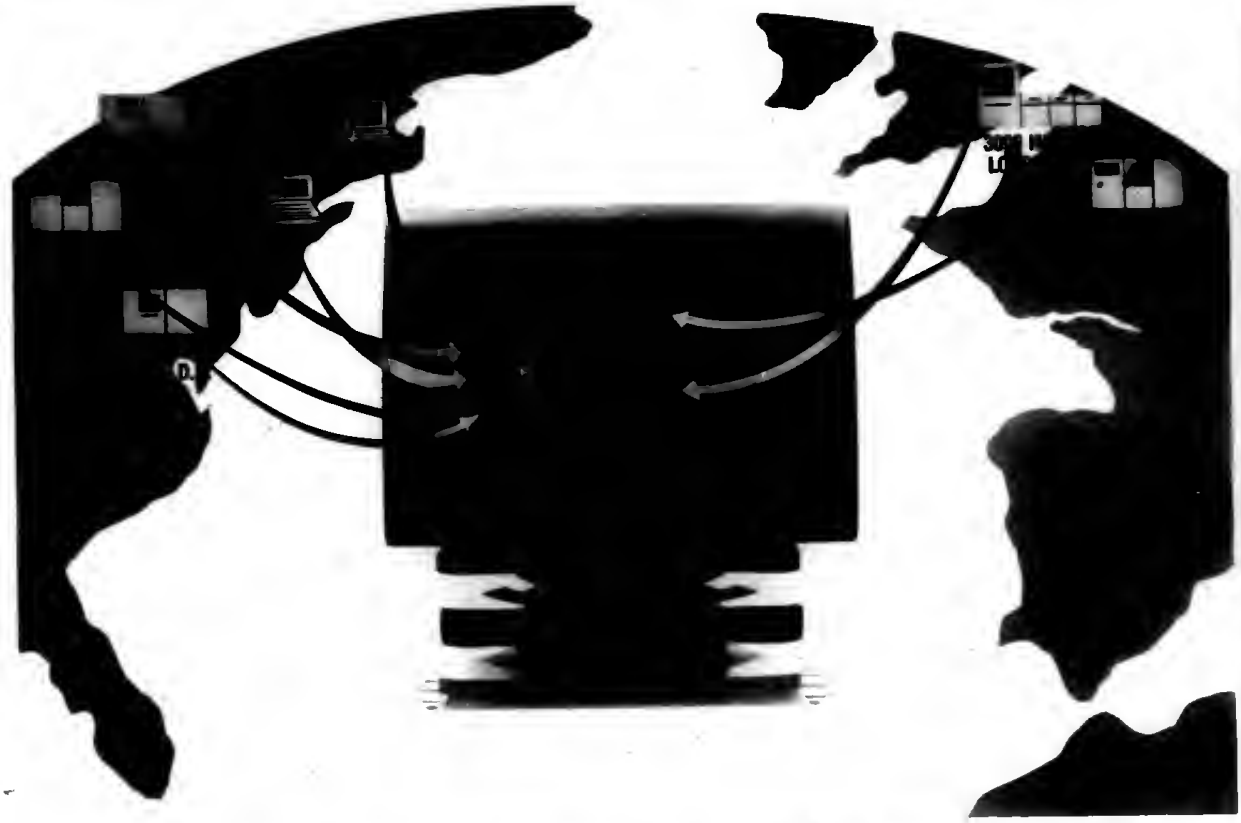
City _____ State/Zip _____

FREE Send this coupon to receive our on-screen demo and complete literature. Better yet, call

800-962-8888

Datalex

100 Pine Street, 24th Floor
San Francisco, CA 94111 (415) 362-4466



Oracle Announces SQL*Star: The First Distributed Relational DBMS

In 1979, Oracle Corporation *delivered* the very first relational DBMS. Oracle also *delivered* the very first implementation of SQL. Today, Oracle is proud to announce that we have *delivered* the very first distributed relational DBMS. It's called SQL*Star,™ and it's an open-system...the very first.

SQL*Star enables organizations to integrate different computers, different operating systems, different networks—even different brands of DBMSs—into a single unified computing and information resource.

SQL*Star allows users to access data stored in different databases—including our own ORACLE and IBM's DB2 and SQL/DS—located on multiple dissimilar systems as easily as if all the information were stored in the same database on a single computer.

SQL*Star is a location-independent, hardware-independent, network-independent, DBMS-independent open system.

Location independence means users don't need to know where their data is located. Whether it's on one computer or on dozens. On one desktop, in one building or around the world.

Hardware independence means users don't need to know on what kind of hardware or under which operating systems their data resides. On mainframes, minis or micros. Under MVS, VM/CMS, VAX VMS, PC-DOS, UNIX or many others.

Network independence means users don't need to know what networks are used to transmit their data. DECNET, SNA APPC, coax connections, Ethernet-TCP/IP, async or others.

DBMS independence means users don't even need to know what DBMS is providing the data: ORACLE, IBM's DB2 or SQL/DS. And in 1987, even VSAM, IMS and other non-SQL DBMSs.

SQL*Star is an **open system,** so you needn't be limited by the network and DBMS interfaces provided by Oracle. Our SQL*Star Toolkits allow *you* to develop your own custom interfaces to networks or DBMSs. And our national consulting organization is ready to assist you with those specialized interfaces.

Best of all, you don't have to wait for SQL*Star to become a reality. It's here. Mainframes, minis, micros. On VAX/VMS, VM/CMS, MVS, PC-DOS, UNIX. DECNET, SNA, coax, async. ORACLE, DB2, SQL/DS. Which is why you should call today, to enroll in the next free ORACLE seminar in your area.

Call 1-800-345-DBMS. Today.

ORACLE®

Compatibility • Portability • Connectability

20 Davis Drive, Belmont, CA 94002

© 1987 ORACLE® Oracle Corporation. The companies mentioned above own numerous registered trademarks. TRBA

Avanti ONX switch acts as building block for networks

By Stanley Gibson

NEW YORK — Avanti Communications Corp. unveiled last week its Open Network Exchange (ONX), a sophisticated T1 switch that performs subrate digital multiplexing.

Designed as a building block for networks that combine public carrier services with private corporate networks, the switch can reconfigure subrate digital multiplexing lines in an almost infinite variety of voice, data and video combinations without bundling them into 64K bit/sec. channels, according to the vendor. The ONX divides each T1 aggregate into multiple groups of bandwidth, each assignable to specific service destinations.

The ONX switch is the first to offer port modules compatible with Bell Communications Research Corp.'s standard for subrate digital multiplexing at standard speeds including 2.4K, 4.8K, 9.6K and 56K bit/sec., according to George Kushin, Avanti vice-president. When AT&T's subrate digital multiplexer is tariffed this year, Avanti will be the first to work with it, Kushin claimed.

The ONX allows the network to gain access to all of the value-added services now offered by various carriers, such as AT&T's Megacom, Software Defined Network and M24/44. The switch is also compatible with AT&T's Digital Access and Cross-Connect System, according to the vendor.

The ONX can switch a specific subrate digital multiplexing channel within a 64K bit/sec. channel of one T1 aggregate to a completely different 64K bit/sec. on another T1 aggregate. The ONX can be used to create networks of more than 100 nodes with more than 7,400 active channels per node, he added.

"Avanti has made a quantum leap over their previous capabilities. They've made a networking product, where the vast majority of products are point to point," said John Sundwall, vice-president of the DMW Group, Inc.

Avanti also unveiled the Open Network Management System/PC, a network management program designed to complement the ONX.

The ONX also supports IBM's Netview PC network management system.

Prices for the ONX, which will be available in May, range from $35,000 to $100,000, depending on the configuration and number of ports.

HP unveils network strategy

By Donna Raimondi

PALO ALTO, Calif. — Hewlett-Packard Co., determined to prove that it is at least the equal of Digital Equipment Corp. in networking prowess, has unveiled a corporatewide networking solution backed by 13 new products.

HP's corporatewide network consists of local-area networks supporting the needs of sales/marketing, business/office, engineering and manufacturing; an X.25 packet-switched backbone connecting the subnetworks; network diagnostic and testing tools; and a centralized host-based network management system that collects data from the diagnostic devices.

Among the HP introductions were the following:

- An X.25 private packet network, priced from $100,000 to several million dollars, that can carry a company's entire data communications between HP and multivendor systems and networks.
- Multiplexers, packet assembler-diassemblers (PAD) and other network interface equipment.
- Management tools, including a $359 statistics software package for the HP 4952A protocol analyzer, for link troubleshooting on X.25 and for IBM Systems Network Architecture networks.
- An X.25 network performance analyzer to detect network performance degradation costs $1,200. It operates with the $14,150 HP 4953A protocol analyzer with Option 001 extended memory.
- Network Services for the DEC VAX computer system, which provide HP-to-DEC communications in manufacturing, engineering, and office environments, costs from $6,000 to $11,000, depending on the VAX model in use.
- Support services that integrate new products and existing products and services to create tailored networking solutions.

Personal computer network vendor 3Com Corp. is an early customer of HP's new X.25 and network management products. Keith Smeby, manager of 3Com's telecommunications research and development of the information systems/data processing department, is evaluating the X.25 network to allow remote sites throughout the U.S. to communicate with each other and with the company's headquarters. Computer equipment consists of HP, DEC and IBM systems. "We are now running HP-to-HP across the X.25 and some HP-to-IBM. Those were fairly easy to do. Now we are working on HP-to-DEC," Smeby said.

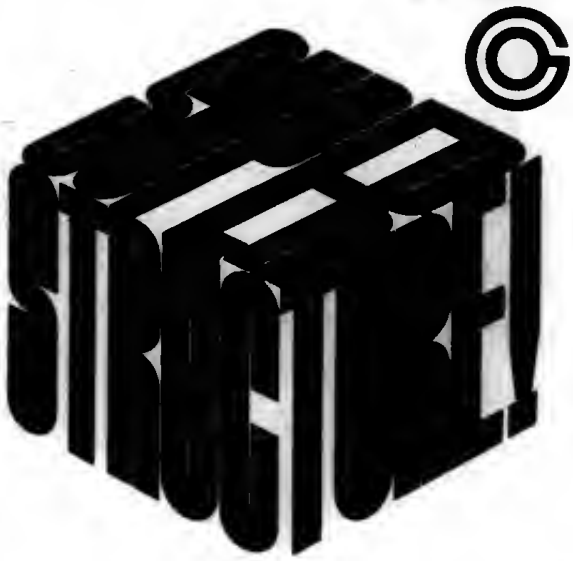
According to Smeby, the network will be manageable at least from a PAD-to-PAD communications point of view. "I'm not sure we will be able to get down to devices outside of the X.25 network. We would like to do that."

Turns Spaghetti Code COBOL Into Structured COBOL Automatically

SUPERSTRUCTURE takes your unstructured COBOL programs and automatically produces structured COBOL programs that are easy to understand and maintain. SUPERSTRUCTURE provides a simple and cost effective alternative to manually rewriting those unstructured programs that are a maintenance nightmare. Of course you can't believe it. Let us prove SUPERSTRUCTURE works, using your programs at your location. SUPERSTRUCTURE—the breakthrough you've been waiting for. Call today. Marketing Director—SUPERSTRUCTURE

Group Operations, Incorporated
1110 Vermont Avenue, N.W.
Washington, D.C. 20005
(202) 887-5420

Offices in: Atlanta, Boston, Chicago, Dallas, Los Angeles and New York



CICS Users:

To increase uptime and control your file availability... Challenge DADS.

Greatly enhances CICS 1.7 allocation capability

- Allocates/deallocates user and transient data files
- Eliminates CICS downtime if files can't be allocated
- Supports all CICS startup options
- Requires no modifications to CICS
- Allocates/deallocates files by groups
- Automatically opens and closes files
- Automatically enables/disables transactions and programs
- Provides security exit and audit trail
- Automatic time-initiated allocation/deallocation
- Batch interface
- O/S core manager
- MVS systems only

DADS (Dynamic Allocation/Deallocation Subsystem)—Productivity Software from STAR

Challenge us!

STAR

Software Technologies and Research, Inc.
160 West Street Cromwell, CT 06416-1930
In CT 203-529-7128 1-800-258-STAR

MIS MANAGERS SEEK MAJOR IMPROVEMENTS THROUGH EXPERT SYSTEMS

Six hundred MIS professionals were recently asked to rank key issues facing them today.* Your top five concerns are listed to the right. One company has distinguished itself by helping several hundred organizations utilize expert systems to address these issues. One company can help you use existing personnel, existing computer hardware, existing applications software and EXISTING BUDGET to implement expert systems solutions. The company is Teknowledge.

WHAT SUCCESSFUL APPLICATIONS OF EXPERT SYSTEMS CAN TEKNOWLEDGE SHOW ME?

Teknowledge's expert systems development tools account for more fielded, knowledge-based applications than those of any other AI firm. No company's expert systems tools are available across a wider range of hardware and operating systems. Teknowledge was awarded (1) the first three patents for expert systems software; and (2) the largest Department of Defense contract ever granted a commercial company for expert systems development software.

Expert systems capture human knowledge, and automate its use by many people. In other words, they can be applied where human judgment plays a role:

- Financial Applications: A major US bank has fielded a credit-evaluation expert system.
- Risk Analysis: One of the top-ten international petroleum companies assesses the risks of oil exploration in specific areas.
- Printing and Publishing: One of the largest US newspapers automates the layout and positioning of printing plates.
- Customer Service: A computer manufacturer has embedded a field-service expert system into its international network which diagnoses faults at customer sites BEFORE they occur. An insurance company diagnoses faults and expedites corrective action in 20,000 computers.
- Engineering: An automobile manufacturer uses the output from an expert system to drive a CAD system which produces complete engineering drawings.
- Education: Not only can the accuracy of diagnosed learning deficiencies be verified, but educators are taught to more accurately classify learning-disabled students.

YOUR FIVE TOP CONCERNS AND TEKNOWLEDGE'S SOLUTIONS

1. ISSUE: ALIGNING MIS WITH BUSINESS GOALS

SOLUTION: Expert systems allow you to extend and automatically apply the knowledge responsible for your competitive success. No other company has done this with more applications than Teknowledge.

2. ISSUE: DATA UTILIZATION

SOLUTION: The database revolution allowed us to capture and store data. The expert systems revolution allows us to capture knowledge which utilizes the accumulated data. Teknowledge-based expert systems may be integrated with existing DBMS and other applications, and are portable across mainframes, minicomputers, workstations and PCs.

3. ISSUE: EDUCATING SENIOR PERSONNEL

SOLUTION: Successful implementation of major projects requires senior management understanding and commitment. Teknowledge can customize an executive briefing and help you communicate the strategic potential of expert systems.

4. ISSUE: SOFTWARE DEVELOPMENT

SOLUTION: Expert systems shells are effective high-level programming tools for developing new applications, and for improving both functionality and maintenance of existing applications. Teknowledge's expert system shells, M.1 and S.1, permit development of applications previously thought impractical due to complexity or cost.

5. ISSUE: PRODUCTIVITY

SOLUTION: Teknowledge understands the costs associated with introducing new technology: Productivity is lowest at the beginning of the learning curve. To minimize these startup costs, Teknowledge has developed a product line that can be applied by your engineers, delivered on your existing computer hardware, and integrated with online applications.

SCHEDULE AN ON-SITE DISCUSSION TODAY.

You have five major concerns: aligning MIS with business goals; data utilization; educating senior personnel; software development; and productivity. You have a budget to address these concerns. Now, you have our phone number, (415) 424-9955, and five very good reasons to use it.

Call or write Teknowledge today, to schedule a no-obligation discussion, at your site, with a team of the industry's foremost knowledge engineering professionals.

My business card or company letterhead is attached.

- ☐ Please call as soon as possible to schedule an in-depth discussion.
- ☐ I'd like to attend the next free, half-day seminar in my area.
- ☐ Please send me a partial customer list and a more detailed discussion of expert systems applications.

TEKNOWLEDGE
Applied Artificial Intelligence

1850 Embarcadero Road
P.O. Box 10119
Palo Alto, California 94303
(415) 424-9955

©Teknowledge 1987.
TEKNOWLEDGE® is a registered trademark of Teknowledge, Inc.

* Washington University Center for the Study of Data Processing as reported in the 11/15/86 DATAMATION, pp 79-86.

Amdahl lowers entry point, adds 3090-class uniprocessor

Aims to lure low-end, expanding buyers

By Jeffry Beeler

SUNNYVALE, Calif. — Amdahl Corp. last week extended its IBM 3090-class mainframe line at the low end with the addition of an entry-level uniprocessor that Amdahl claimed yields roughly 30% better price/performance than the 3090 Model 180.

With throughput estimates of more than 21 million instructions per second (MIPS), the Amdahl 5890-190 provides up to 54% the execution rate of Amdahl's existing 5890-300 dual processor.

Though much less powerful than the 41-MIPS Model 300, the 190 is said to be better suited than the two-way CPU complex to applications in which transactions have to be processed serially.

"For environments where each execution step depends upon the completion of the one that immediately preceded it, users gain nothing by having more than one engine," said Dennis Stein, Amdahl's manager of processor systems marketing. "What those kinds of users need when the time comes to upgrade their systems is a bigger uniprocessor."

In a formal statement that coincided with its Jan. 20 announcement, Amdahl characterized the 190 as the largest uniprocessor it has ever made — a distinction that previously belonged to its 5860, which will continue to be sold.

Faster than 5860

Compared with the existing 5860, which executes one machine cycle every 18.5 nsec, the 190 is rated at 15 nsec and boasts improvements to both its cache algorithms and pipelining techniques, Stein said.

The combination of a reduced machine cycle time with other design refinements, he explained, makes the 190 approximately 50% faster than the 5860, which executes 14 MIPS.

The introduction of an expanded Amdahl uniprocessor creates a natural growth path for 5860 users who are locked into serial processing requirements but who need more power than their current engines can deliver, Stein said.

Announcement of the 5890-190 also lowers the entry point to Amdahl's 5890 mainframe series — a much-needed move, according to Steve Terry, corporate systems services manager at Unisys Corp.'s Peripheral Products Division and a 5860 user. Unisys is the result of the merger of the former Burroughs Corp. and Sperry Corp.

Upgrades to the previous entry-level 5890 machine, the Model 200, were not available for users of the Amdahl 580 series models that competed with the IBM 3080 family.

'Letting users grow'

Now, however, "Amdahl is clearly giving its users a way of entering the 5890 with a lower MIPS rating and then allowing them to grow to larger members of the family," Terry said. "Their strategy is excellent, because they have many users in the 5- to 10-MIPS range plus another large group at around 15 MIPS and need to get their entry point as low as possible."

A similar view of the 5890-190's debut was expressed by Daniel Benton, a securities analyst with New York-based Goldman, Sachs & Co. "An awful lot of users of 580-series mainframes will probably see Amdahl's latest announcement as a bridge to the 5890 line," he said.

But as an upgrade path, the 5890-190 may prove most attractive to users of Amdahl's 5840 and 5850 uniprocessors, Benton added. Both the 7.5-MIPS 5840 and the 10-MIPS 5850 are deliberately degraded versions of the 5860.

Although the 5890-190 will probably go primarily into Amdahl's own installed base, it may also snare some users who might otherwise have acquired IBM 3090 Model 150s or Model 180s, according to John Jones, a senior analyst with Montgomery Securities, Inc.

"In fact," Jones said, "the single-processor 190 is only slightly less powerful than IBM's dual-processor 3090 Model 200 and costs substantially less." Moreover, with a maximum capacity of 48 channels and 256M bytes of main memory, the Amdahl mainframe offers greater expandability than the Model 180, which holds only up to 32 channels and 64M bytes.

After it reaches its expansion limits, the 190 can be upgraded further to a 5890-300, which in turn can become a 70-MIPS 5890-600, a four-way processor complex that marks the top of Amdahl's mainframe line.

The 5890-190 is geared chiefly for IBM CICS, batch and other applications containing "transactions that are queued and then executed one at a time," Amdahl's Stein said.

Like the other three members of the 5890 family, the 190 supports Expanded Storage and Amdahl's Multiple Domain Feature, which allows up to four discrete operating environments to reside concurrently in the same CPU.

In a basic configuration incorporating 16 channels and 32M bytes of main memory, the machine costs $2.63 million, with shipments scheduled to begin in March.

What IBM can't tell you about TSO.

1 How to have 12 parallel TSO sessions from the same terminal, using only one TSO-ID. *Just think... you can switch between ISPF, SDSF, INFOMVS, RMFMON, OMEGAMON, SAS, FOCUS, SMP/E, even multiple ISPF's instantly.*

2 How to "hotkey" to CICS, IMS, NCCF, VM, DOS, etc. (up to 12 VTAM or TCAM applications) without logging on and off. *A programmer's dream... and it cuts CPU consumption.*

3 How to enhance security with automatic "LOCK" instead of timeout cancel. *Goodbye S522 abends.*

4 How to capture screen images to send to other users or save to disk. *Great for help desk and writing documentation.*

5 How to cure inconsistent TSO response time by cutting out 90% of non-trivial transactions' overhead. *Turn "oink-oink" into "zoom-zoom."*

6 How to have directories of your datasets by projects for instant edit, browse, utilities, etc. *Improves ISPF users' productivity by 50%.*

TSC can tell you how to do all this and more with PIE/TSO™ while improving overall response time, boosting productivity and reducing total resource consumption.

Over 10,000 TSO users say, "PIE makes TSO the perfect development tool."

Call or write for more information on PIE/TSO™... (PIE/CICS™ and PIE/VM™ are also available). You can lease PIE/TSO™ for as low as $50 per month.

TSC
Technologic Software Concepts, Inc.
150 El Camino Real, Tustin, CA 92680
(714) 730-1290 Telex 5101000764

Send me more information on:
☐ PIE/TSO ☐ PIE/CICS ☐ PIE/VM
Name
Title
Company
Address
City
State/Province
Zip/Postal Code
CPU's Op/Sys
A26
TSC
Technologic Software Concepts, Inc.
150 El Camino Real, Tustin, CA 92680

©Copyright 1986, Technologic Software Concepts, Inc

SAS, OMEGAMON, and FOCUS are trademarks of SAS Institute, Inc., Candle Corp. and Information Builders, Inc., respectively

COMPUTERWORLD

Fill out and mail in the attached postage-paid envelope.

Please enter my subscription to COMPUTERWORLD at the low Special Introductory Rate of just $38.95 for 51 issues — a savings of $5 off the basic rate. Plus, I'll receive the COMPUTERWORLD FOCUS issues FREE with my subscription.

☐ Payment enclosed ☐ Bill me

☐ Charge my credit card ☐ AmEx ☐ VISA ☐ Mastercard

Signature _____ Card Expires _____

FIRST NAME | M.I. | LAST NAME

TITLE

COMPANY

ADDRESS

CITY | STATE | ZIP

Address shown ☐ Home ☐ Office

☐ I'm already a subscriber, but I'd like to extend my subscription at this special low rate (Attach mailing label above.)

Canada, Central & South America $110/ Europe $165/ All other countries $245 (Airmail) · Foreign orders must be prepaid in U.S. dollars

Please complete the information to the right to qualify for the special introductory rate

Basic Rate: $44

COMPUTERWORLD

Please indicate your business [illegible] with computer systems not be[illegible]

10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government–State/Federal/Local
65 Public Utility/Communications Systems/Transportation
70 Mining/Construction/Petroleum Refining/Agriculture
80 Manufacturer of Computers, Computer Related Systems or Peripherals
85 Computer Service Bureau/Software Planning/Consulting
90 Computer/Peripheral Dealer/Distributor/Retailer
75 User: Other _____
95 Vendor: Other _____
(Please specify)

IS/MIS/DP MGT
19 Vice President, Asst. VP
21 Dir. Mgt. Supv. IS/MIS/DP Services
22 Dir. Mgr. Supv. of Operations Planning, Adm. Services
23 Dir. Mgr. Supv. Analyst of Systems
31 Dir. Mgr. Supv. of Programming
32 Programmer, Methods Analyst
35 Dir. Mgt. Supv. OA/WP
39 Data Comm. Network/Systems Mgr
OTHER COMPANY MANAGEMENT
11 President, Owner/Partner, General Mgt
12 Vice President/Asst. VP
13 Treasurer, Controller, Financial Officer
ENGINEERING
41 Engineering, Scientific, R & D, Tech. Mgr
SALES
51 Manufacturing Sales Reps., Sales/Mktg. Mgr
OTHER PROFESSIONALS
60 Consulting Mgt.
70 Medical, Legal, Accounting Mgt
80 Educators, Journalist, Librarians, Students
90 Others _____
(Please specify)

Types of equipment with which you are personally involved either as a user, vendor, or consultant

A Mainframes/Supermins
B Minicomputers/Small Business Computers
C Microcomputers/Desktops
D Communications Systems
E Office Automation Systems
F No Computer Involvement

NEWS

Prime beefs up Series 50 with 2755 office machine

By Stanley Gibson

NATICK, Mass. — Prime Computer, Inc. beefed up the mid-range of its Series 50 32-bit superminicomputers last week by announcing the 2755.

Prime claims the machine is its highest performance office system, offering an average of 20% to 25% better performance than its predecessor, the 2655 superminicomputer, at an average price increase of 4%.

The supermini is designed to exist outside a computer room, in offices or other work areas where up to 128 terminals can be directly attached.

A departmental system

"It can handle complex computing problems for a business that may not be prepared to support the cost of a computer room system. But it's not limited as a stand-alone; the 2755 can operate effectively as a departmental system in a broader network that includes personal computers and corporate mainframes," said Stephen C. Kiely, vice-president of systems marketing and development for Prime.

The machine's performance increases — up to 35% more than the 2655 — are the result of reduced memory-access time, enhanced handling of machine instructions and an enlarged cache memory. The 2755 CPU executes approximately 1.6 million instructions per second (MIPS), compared with 1.3 MIPS by its predecessor, according the the vendor.

The 2755's features include 64K bytes of cache memory, quadruple that of the 2655; 16M bytes of main memory, double that of the 2655; and support for up to 126 directly connected terminals, also double that of the 2655. Maximum on-line disk storage is 4.2G bytes.

It can also provide for up to 63 remote users connected via Primenet software, a distributed network for both local- and wide-area communications.

Peripheral support

The 2755 is hardware and software compatible with other Series 50 computers and supports the same peripherals as other machines in the 50 series.

Users of the 2655 can change their system to a 2755 by using an in-cabinet upgrade. The 2655 was introduced in October 1985.

Available for immediate shipment throughout the world, a basic configuration of the 2755 system ranges in price from $95,050 to $133,200.

AT&T cuts Unix PC prices

By Patricia Keefe

MORRISTOWN, N.J. — AT&T Information Systems has slashed the prices of its Unix PC 7300 and 3B1 by as much as 32%, also reducing prices 12% to 17% on its PC 6300 and PC 6300 Plus.

The cuts coincide with reports that AT&T will soon announce an enhanced version of its Intel Corp. 80286-based 6300 Plus that will feature IBM Personal Computer AT bus compatibility.

The first-ever price reductions on the Unix PC and 3B1, both manufactured by Convergent Technologies, Inc. in San Jose, Calif., have also fueled speculation that AT&T this year will quietly drop the Unix PC and what remains of its foundering relationship with Convergent.

AT&T spokesman Mark Siegal declined to comment on speculation that the Unix PC will be killed, characterizing the Unix PC price cut as a response to market conditions.

"What we have found with all our computers is that price is becoming an increasing factor in the purchasing decision," Siegal said.

But in an interview last month with CW Communications International News Service, Bruno Lamborghini, chief economist for Ing. C. Olivetti & Co., said the Unix PC would be phased out in 1987.

AT&T owns a 25% interest in Olivetti. In October, in a move lauded by analysts, AT&T strengthened that relationship by turning over responsibility for future personal computer development to Olivetti. Lamborghini said he expects U.S. sales to improve now that Olivetti is in charge.

Ashton-Tate finally ships Rapidfile

By Douglas Barney

TORRANCE, Calif. — According to beta-test users, Ashton-Tate's Rapidfile software was not rapid enough, a problem which delayed the product's shipment until last week.

"We decided we were going to lose a lot more credibility if we shipped when it wasn't ready than to miss our date by a few weeks," said Mike Arrigo, Ashton-Tate's product manager for Rapidfile.

Rapidfile, a $395 file management package, was originally scheduled to ship last December, but users' and analysts' criticisms of the time it took to load files from Dbase III, the dominant microcomputer data base package, caused Ashton-Tate to rework the package.

"We improved the time it takes to load a Dbase file. Because it is a disk-intensive operation, you get the most amount of improvement on a floppy-based system, up to 10 times, and on a hard disk, it is twice as fast," Arrigo said. "We did some benchmarks in our test department, and in an extreme case, a 60,000-record file that used to take 40 minutes to load now takes four minutes."

Ashton-Tate also speeded up the product's file sorting. "We saw increases of 15 to 20 times in sort speeds on very large files," Arrigo said.

THE CAMBEX 3090 ALTERNATIVE

Preserving corporate resources - it just makes good business sense. That is why many mainframe users are retaining the 308X system and upgrading main memory instead of changing to a 3090.

A few good reasons to upgrade with Cambex memory:

PRICE. RELIABILITY. DELIVERY.

Making your 308X perform at its top capacity is now easier than ever before. Our STOR/8000 Universal add-in memory gives you 8, 16 and 32MB increments at prices a full 40% lower than IBM's, yet with much higher reliability figures. Cambex boards add in just like IBM boards, with no extra space, cabinets or cooling. But unlike IBM add-in memory, the STOR/8000 is transplantable among all 308X models.

As the only independent manufacturer of add-in memory for the 308X series, for 16 years Cambex (formerly Cambridge Memories) has added memory to every model of large-scale IBM computers.

Cambex Corporation
360 Second Avenue
Waltham, MA 02154

(US) 800-325-5565
(MA) 617-890-6000
(TLX) 92-3336

Cambex - A GOOD PLACE TO PUT YOUR INFORMATION

PC DATA ENTRY

Increase your operator productivity and improve data quality with AusDataEntry.

Are your operators idle when dedicated terminals are down? Do they outkey Keypunch and Key-to-Disk terminals? Boost their productivity with a PC and AusDataEntry; a program so fast and powerful, it lets you get rid of those terminals and their high maintenance costs.

No operator, no matter how fast, can outkey AusDataEntry. This program controls the PC's drivers to bring its speed up to "heads down level."

Yet even casual operators will find data entry easy. AusDataEntry includes a Format Programming Language (FPL) that lets your staff create custom input screens without the help of programmers. FPL also improves data quality with advanced data validation features like conditional statements and table look-up.

Operators learn faster with a choice of keyboard layouts. AusDataEntry lets you choose from PC keyboard layouts that emulate keypunch or 3741 terminals.

To see how your data entry can be more productive, call 800-255-3589 ext. 55 for an evaluation package of AusDataEntry. Or write to AusData/USA, Ltd., 2326 Walsh Avenue, Santa Clara, California 95051.

AUSDATAENTRY™

©1986 AusData USA, Ltd

Firms ready systems to rival delayed MS-DOS release

Shipments scheduled to start next month

By David Bright

Microsoft Corp.'s industry standard MS-DOS personal computer operating system will soon have some competition.

While corporate interest in the new class of Intel Corp. 80386-based personal computers is growing fast, Microsoft's new version of MS-DOS, which will take partial advantage of the new systems, may not be released for eight months or more, according to most reports.

The new version is expected to provide multitasking and eliminate the 640K-byte random-access memory barrier of the current versions. Even then, the operating system will probably be designed for the 80286-based IBM Personal Computer AT and compatible systems.

Alternatives

In the meantime, several 80386-based alternative operating systems — some of which are said to be MS-DOS-compatible — will become available in the first and second quarters of this year.

Considering the time lag with the new MS-DOS, along with some of its expected limitations, developers of alternative operating systems may suddenly have a "window of opportunity," says Dataquest, Inc. analyst Norm DeWitt.

It is DeWitt's understanding that DOS 5.0, as the new version is often called, will provide multitasking for applications that have been rewritten for it. Only one MS-DOS 3.X application will be able to run at the same time as the new programs. "This may mean that the end users are very likely going to be forced to go out and buy all new software to take advantage of the multitasking capability," he says. DeWitt adds that developers at this point report they have found that 3.X applications run slower on an 80386-based system than they do on an 80286-based machine.

Up to now, most systems managers simply have not had enough information about the new operating systems to make a decision. Although many microcomputer managers have vowed to stick with the standards and wait for IBM and Microsoft's next moves, some managers say they may investigate the new software.

At Eaton Corp.'s world headquarters in Cleveland, PC support center manager Fred Zickert says he may take a look at the new systems if they offer MS-DOS compatibility. "Certainly we're not afraid of them," he says. "If they strike our interest, we will be taking a look at them because right now we are beginning to get a backlog of requests [for 80386-based machines]."

Other managers already seem to have made up their minds as to which direction to take, however. There are too many unknowns and no turning back once the alternative systems are installed, notes Ed Macke, manager of PC systems at Northrop Corp.'s Defense Systems Division in Rolling Meadows, Ill. Macke says he would not have time for the extensive testing that would be necessary.

The competing operating systems are being readied at such companies as Softguard Systems, Inc., The Software Link, Inc., Pick Systems and Theos Software Corp.

Operating systems that run Unix and MS-DOS applications simultaneously on 80386-based systems are also being developed by a Microsoft/Interactive Systems Corp./Phoenix Technologies, Ltd. triumvirate, as well as by Locus Computing Corp. and Microport Systems, Inc.

Softguard Systems' VM/386 environment will use the 80386's virtual-machine feature to perform multitasking with MS-DOS and other operating systems at the same time, according to the company.

Claimed to be a superset of MS-DOS, The Software Link's PC-MOS/386 will reportedly also run several MS-DOS programs simultaneously and run 32-bit applications using standard MS-DOS commands.

Software Link to ship system

The Software Link plans to ship its operating system next month. Softguard also expects to ship a single-user subset of VM/386 next month for running 32-bit applications, while the target date for VM/386 is June.

Pick Systems may have its non-MS-DOS-compatible Pick 386 operating system ready in the second quarter, says sales manager John Marshall. Pick Systems' software already boasts a strong following, with more than 2,000 applications from microcomputers to mainframes, according to Marshall.

The Theos system was derived from Oasis, a highly acclaimed multiuser operating system common on Zilog, Inc.'s Z80-based systems in the late 1970s and early 1980s.

Theos Software's Theos 386 currently runs on a multiuser microcomputer system and will, in the future, be ported to 80386-based PCs as well, according to Theos President Susan Catalano. The company also provides an MS-DOS emulator that runs under its 80386 and 80286 operating system versions.

Instant Gratification

Announcing the Canaan DCS 6000™ Series

The Only Affordable 370-Based Superminimainframe That Outperforms IBM's 9373 Is Available Now

- Features a price/performance advantage of 30-50% over IBM's 9373
- Offers the lowest price, most powerful entry system for the multi-user 370 environment
- Based on Canaan's proven technology, installed in many Fortune 200 companies since 1983
- Runs standard mainframe software packages, as well as CICS COBOL applications
- Requires no special cooling, plugs into standard wall outlets, and starts (IPL) with the push of a single button
- Attractive, desk-height, quieter than PCs
- Available now

Call Canaan Now For Quick Delivery! 1-800-382-4100

CANAAN

Canaan Computer Corporation 39 Lindeman Drive Trumbull, CT 06611 (203) 372-8100

Cullinet seeks joint ventures in aggressive CIM strategy

By Rosemary Hamilton

WESTWOOD, Mass. — Cullinet Software, Inc. last week outlined a highly ambitious computer-integrated manufacturing (CIM) strategy and paid product introductions will begin this spring.

The announced CIM plans were part of a status report on the corporate strategy Cullinet announced last September. The CIM plan is based on the challenging goal of eventually offering more than 30 additional CIM products resulting from either product acquisitions or joint ventures.

Cullinet's CIM scheme starts with the premise that the firm cannot offer customers all the necessary software components of a CIM solution, company officials said. "We have the technical foundation and many applications," said Charles Nedell, director of application product services. "What we don't have is many other applications that we don't intend to do because there are good products already out there."

According to Fred Gafner, a CIM product manager, Cullinet has identified 55 CIM-related applications, from computer-aided design (CAD) to job scheduling on the shop floor. Of those, Cullinet currently markets 22 packages, which make up the Cullinet Manufacturing System, as well as its products for repetitive manufacturing environments.

Strategic partners

The remaining 33 applications will eventually be offered to Cullinet customers and will result from either product acquisitions or joint development and marketing arrangements with hardware and software vendors, Gafner said. Cullinet would not release specific information on these potential product acquisitions or strategic partners.

However, Gaftner said Cullinet is currently negotiating with some of the major CAD vendors, including Cadam, Inc., to form strategic alliances and develop gateways to link the vendors' software environments. A gateway product that would, in effect, function as Cullinet's end of the link is about to be tested, Gafner said. It is a joint effort between Cullinet and a software development company, the name of which Gafner said he could not disclose.

Tom McDoniel, director of commercial products, said he sees these partnerships as more promising than the Cullinet agreement with Lotus Development Corp., a partnership that also involved a gateway product and eventually collapsed.

"The Lotus agreement concerned competitive products," McDoniel remarked, "whereas these will be with vendors who offer something we don't plan to."

Of the 33 applications Cullinet plans to offer, the vendor said it will pursue strategic partnerships for 17 of the applications and is seeking to buy either technology rights or actual products for the remaining 16 applications.

In addition to the CAD area, a strategic partnership is expected to be forged with a shop-floor data collection vendor, said Gafner, who explained that customer surveys have identified this application and CAD as the top two priority areas.

There are at least a half dozen applications at the cell level on factory floors, such as those applications that govern numerical control equipment, that also lend themselves to joint ventures because "they're very hardware driven, and we're not in the hardware business," Gafner said.

On the product acquisition side, Gafner said the two priority areas are forecasting and project management, although he could not announce specific plans other than to say discussions are under way.

Banyan to ship 386 products

By Patricia Keefe

WESTBORO, Mass. — Banyan Systems, Inc. will ship an Intel Corp. 80386 version of its Vines distributed network operating system by mid-year, followed by an 80386-based file server by year's end, a company official said last week.

"Users don't care [about particular processors], but they want performance. We think the 386 is a good solution," said Robert Stearns, vice-president of marketing.

Specifically, Banyan users can expect to achieve higher performance and more storage capability and to be able to run more local-area networks concurrently under Banyan's 386-based solution, Stearns said.

For example, Banyan's current server can support 20 serial ports. The 386 server will double that capacity, support more peripherals and feature more sophisticated communications applications.

Vines 386 is simply an enhanced version of Vines 286 running in 386 mode, Stearns noted. "It's not a terribly difficult task."

Like its competitors, Banyan is not waiting for IBM to release its much-anticipated 386-based personal computer.

"I'm not worried about [IBM's plans] with the 386. They have a lack of server technology in general. Whatever IBM does will not directly impinge on us," Stearn said.

ONLY INTELLECT/DB2 DELIVERS NATURAL LANGUAGE ACCESS TO DB2

INTELLECT/DB2 combines the power of DB2 with INTELLECT, the AI-based natural language software used by over 450 organizations worldwide. INTELLECT/DB2 enhances your investment in DB2 by giving managers AI-based, natural language access to DB2. INTELLECT/DB2 understands ambiguous questions and lets managers express themselves using their own vocabulary, which it learns as it's used.

"INTELLECT/DB2 helps our executives make more informed decisions by allowing them to access market data on their own, in everyday English."

Assistant VP, Data Processing
Maryland Casualty Company

AI-based natural language is one of six requirements for using AI to deliver DB2 to management—and only INTELLECT/DB2 meets all six. Attend a free seminar and find out how you can use INTELLECT/DB2 to bring DB2 to your management.

1. NATURAL LANGUAGE
INTELLECT/DB2's advanced AI techniques let managers use everyday English to access DB2 data.

2. AD HOC ANALYSIS
Managers get English access to totals, minimums, maximums and percentages, correlations and ratios—automatically displayed in summary or graph form.

3. APPLICATION BUILDING
Within security constraints, managers can create and update tables, build forms for data presentation, and request reports.

4. PROPER USE OF DB2
INTELLECT/DB2 uses all DB2 capabilities to full advantage. And as an SQL generator, INTELLECT's interface to DB2 makes complete use of DB2's power while optimizing SQL coding for maximum efficiency. An automatic "Instant English" facility gets you started fast.

5. OPEN ARCHITECTURE
Use DB2 or other databases and file structures in many ways. With our PC Link, reformat DB2 data into a Lotus 1-2-3 worksheet and send it to a PC.

6. THE RIGHT VENDOR SUPPORT
Our 11 years of delivering commercial AI solutions to over 450 businesses means you get fast, expert assistance and access to total product support including a hotline, training, and consulting.

See for yourself how you can use AI to deliver DB2 to management. Call our Seminar Registration Office today at (617) 890-8400, or return the coupon.

Boston	April 8
Chicago	February 10
Cleveland	March 12
Dallas	February 25
Denver	March 19
Detroit	March 5
Hartford	March 18
Houston	February 11
Los Angeles	February 17
Minneapolis	April 2
New York	February 19
New York	April 15
Philadelphia	March 3
Raleigh	February 18
Sacramento	March 26
San Francisco	February 24
San Jose	March 11
Toronto	April 9
Washington DC	February 26
Washington DC	April 16

CALL (617) 890-8400

☐ I'll attend a free INTELLECT/DB2 seminar
City Date
☐ I can't attend, but send a free book
Name
Title
Company
Street
City
State Zip
Telephone

INTELLECT is a trademark of Artificial Intelligence Corporation. DB2 is a registered trademark of IBM. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation.

AICorporation
USING AI TO DELIVER INFORMATION TO MANAGEMENT

VIEWPOINT

EDITORIAL

The look and feel of a can of worms

The pair of lawsuits filed by Lotus Development Corp. alleging illegal cloning of 1-2-3 has created a stir befitting the potentially enormous consequences of the suits. There are a lot of worms stirring within the documents Lotus filed in federal court. The only birds likely to leave this debacle feeling satiated are the lawyers.

No, this isn't the basic software copyright suit, where the plaintiff charges unlawful copying of code. Rather, Lotus is contending that a couple of moderately successful packages are illegal because they look and feel like 1-2-3.

The first thing the judicial system will have to decide is exactly just what "look and feel" means. Once that problem is licked, the court will have to determine if a company can lay exclusive claim to the look and feel of its software. The courts will then pass judgment on the matter. And five years later, when the appeals process has come to a conclusion, they will announce the winners and losers.

However, we won't have to wait five years to feel the repercussions of this suit. One company developing an Intel Corp. 80386-specific operating system sent out press material last week, stating that its operating system is not a superset of Microsoft Corp.'s MS-DOS — as previously described — but rather an independently developed system.

There just aren't that many companies willing or financially able to go toe-to-toe in court with the Lotuses or Ashton-Tates or Microsofts of the world.

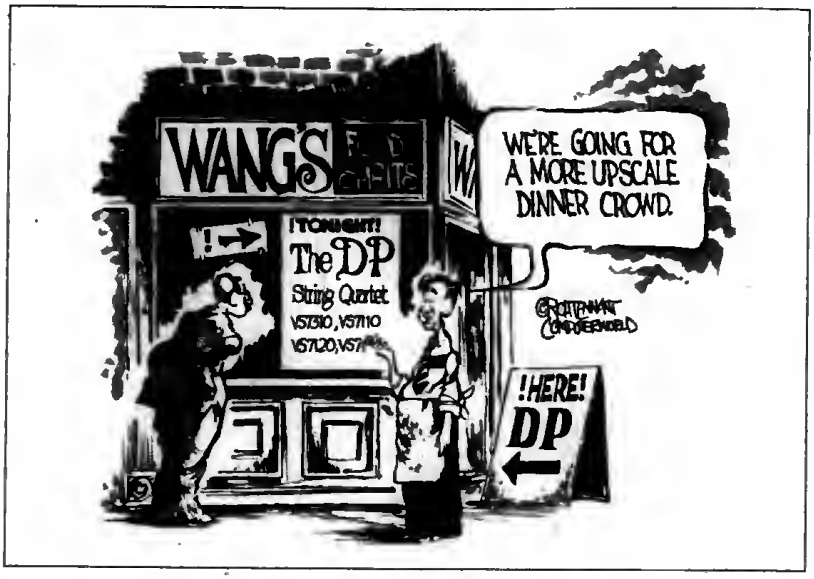
Further, the Lotus suit is sure to make some current and potential users of the alleged imitators skittish as they wonder if future enhancements of and support for the alleged copycats will be available.

Clearly, Lotus or any other company should enjoy the protection of the law when someone steals what's rightfully theirs. In Lotus's case, the company has much to lose to relatively cheap knockoffs of its 1-2-3 cash cow.

Users also stand to lose tremendously if protection can't be guaranteed for costly research and development efforts aimed at producing advanced computing solutions that imitators simply steal. The computer industry has been the scene of some of the most blatant and outrageous of copyright violations. Software is a prime candidate for such rip-offs, because actual package production costs are so low — once a market is established, that is.

But in its filings in court, Lotus says that the two packages in question are "copies — albeit, inferior copies." At a press conference in which the suits were discussed, company officials stressed that the packages posed no great threat to Lotus.

So if the packages are inferior and pose no great threat, just what is Lotus after? The answer would seem to be the market the company essentially created and now feels it should essentially own.



LETTERS TO THE EDITOR

Tax reform vs. competitive sabotage

My thanks to *Computerworld* for the article, "Tax reform dooms DP free-lancers" [CW, Dec. 15].

I am dismayed to see, once again, how the actions of just a few self-serving individuals adversly affect the livelihood and prosperity of so many. I strongly resent the insidious manner in which the technical service firms managed to sabotage their competitors under the guise of the tax reform bill. They managed to get the Joint Committee on Taxation to put Section 1706 into the bill, which makes it illegal for their competitors to continue doing business. The public was never told about this until after the fact.

Not only are the individuals running the technical service firms unwilling to attempt to compete in the normal marketplace, they are unwilling to expose their political activities to public scrutiny and debate.

What sense does it make to claim that the use of subcontractors gives some consulting firms an unfair advantage over others?

If the larger technical service companies thought it was more profitable to use subcontractors, they could have used them themselves, rather than trying to force everyone else to do business the way they do.

If the Independent Computer Consultants Association does not launch an all-out effort against Section 1706 of the tax act, it not only will be failing to serve its members but will simply disappear, along with those it represents.

While the stated purpose of Section 1706 is to collect more taxes, it is clearly an effort to remove competition. It will have the effect of taking money from the pockets of practically everyone involved.

The independents who become contract employees will make less money or will leave data processing, and the smaller, more efficient consulting businesses will vanish because it isn't practical for a small firm to keep year-round employees for unpredictable short-term projects.

With the lower end of the price scale removed, only the higher priced technical service companies will remain, with these higher costs passed on to the client.

Clearly, when there are dollars involved, ethics, morality and common decency don't even seem to exist.

Phil Nowak
Chicago, Ill.

Parlez-vous videotex?

In response to Michael A. Conniff's article, "Videotex: Beyond the word" [CW, Nov. 3], I believe Conniff to be a little bit lost in the videotex world. Saying that "the French government came ashore . . . calling their solution everything from 'antiope' to 'telematics' to 'minitel,' " gives me the feeling Conniff also doesn't know the differences between them.

Antiope is a private service available on a television through Hertzian waves. It has nothing to do with videotex. Telematics is a general term that merely means telecommunication. It has still nothing to do with videotex except that videotex is a technology in the telematics scope. Minitel is the device name of the terminal through which people access videotex services. For Conniff's own knowledge, there is only one word regarding French videotex: It's Teletel.

In addition, French videotex is becoming a multimillion dollar industry. Videotex traffic in France totaled 2,325,254 access hours, with 1,724,193 Minitel terminals in active use. Featuring over 2,000 services ranging from bulletin boards to electronic banking, shopping, mailing and specialized data bases, videotex, in France, works.

Laurent Van Huffel
Manager of Marketing Support
United Software Systems and Services Corp.
New York

A key player in parallel processing

Your article, "Parallel Processing" [CW, Dec. 22], was both interesting and disappointing. It was interesting from the point of view that you believe this type of architecture's time is about to come and that the major vendors are slowly but surely moving toward this technology. It was, however, disappointing that Encore Computer Corp., an early leader in developing the technology and a successful key player in this area, was only given a name mention as an example of multiprocessing.

Please keep in mind that Defense Advanced Research Projects Agency (also mentioned in your article), after a highly competitive bid, chose Encore and our Multimax technology as the company and architecture of choice to build a 1,000 million-instructions-per-second, general-purpose system. As a result of this $10 million award, Encore will be

Continued on page 18

VIEWPOINT

Waiting for the wind to go out of software pirates' sails

How much is piracy costing the American computer industry?

It depends on whom you listen to. The Department of Commerce estimates that all piracy — including that of records, tapes, books, computers, software and the like — costs U.S. vendors $1.3 billion per year, according to Harvey Bale Jr., assistant U.S. trade representative. Computers and software represent more than half of that total, about $800 million.

However, according to an analysis by Apple Computer, Inc., the cost is much higher. Albert Eisenstat, Apple senior vice-president, says hardware and software piracy has cost the U.S. computer industry in excess of $20 billion in the last five years, with an attendant loss of some 750,000 jobs.

Legitimate packages

A 1985 study by Future Computing, Inc. projects software losses alone at about $800 million per year. The study further estimates that for every legitimate personal computing software package in use, one unauthorized copy exists. However, a study by Infocorp covering the same period indicates that software publishers are losing only about $170 million per year — a fraction of their $5 billion in revenues. Microsoft Corp. seems to agree with this assessment, according to corporate spokesman Marty Taucher, who says, "We've never run into copying as a major problem."

On the other hand, The Association of Computer Retailers reports that software, which represented some 25% of members' sales in 1984, has dwindled to only 6% of sales in 1986. A recent issue of "Electronic Education" was entirely devoted to the problems of piracy. The articles noted two disturbing results of piracy: the abandonment of the edocation software market by several major publishers and the reduced incentive for software authors to develop new, innovative packages.

It is clear that certain portions of the market are affected more than others. Publishers and retailers of educational, home and widely used business packages seem to be deeply affected, while value-added resellers and producers of custom packages seem to be largely unaffected.

What is also clear is that user friendliness and copy protection are incompatible. Protected software is difficult to load and use on hard-disk systems. Key lock and code identification systems are also objectionable to both users and retailers alike — to users because they are cumbersome to use and to retailers because they must stock extra parts and furnish additional end-user hand holding.

Some vendors, like Microsoft and Ashton-Tate, believing piracy is a relatively inconsequential problem, decided to put the desires of their customers first and removed copy protection from their packages. Other vendors, like Lotus Development Corp., fearful of making it any easier for pirates to copy their packages, continue to employ copy protection and are pressuring ADAPSO to formulate industrywide copy-protection standards.

Apple has also taken a hard line in legally fighting the fake Apples produced throughout Asia. This problem, of course, is different from software piracy, but there is overlap since successful hardware copying will inevitably spark software copying. Today you can buy a pirated copy of nearly any software package you wish — Framework II, Lotus 1-2-3, MS-Word, Turbo Lighting and even Xenix — in Hong Kong at 50% to 90% less than the U.S. price.

By DAVID H. AHL

What will be the long-term effect of widespread piracy? For guidance, one can look to the music and film industries. Both proposed legislation to tax tape recorder and blank cassette sales to reimburse entertainers for lost revenue caused by copying. The entertainment industry pointed to the dire consequences of diminishing artists' incentives to perform: There would be fewer movies and recordings from which consumers could choose.

The consumer electronics industry responded by forming "Right to Tape," a well-funded lobbying group opposed to any restrictions on copying. Enactment of legislation is a long and painful process; after many years, practically nothing has happened.

Meanwhile, film studios are as busy as ever, concerts are more popular than ever, and, if there is a dearth of recordings, it is simply because the compact-disk presses can't keep up with demand. Filmmakers discovered that it was actually more profitable to sell more units at a lower price. Rarely is one priced above $29.95; two years ago, $79.95 was the norm.

Temporary shifts

While there are differences between the audio/video and computer software markets, there are enough similarities to draw some conclusions. First, software authors will not desert the market. While they may make some temporary shifts — education to business, for example — in general, innovation will not die.

Second, manufacturers are going to reduce prices to a point where piracy really doesn't pay off. In doing so, they will be surprised at how much additional demand they generate.

Third, technology will eliminate some of the problem. Just as compact disks provided an inadvertent solution for the entertainment industry, they, or another device, are likely to solve some of the piracy problems in the software industry.

My view is to forget about piracy. A free market and technology are much stronger forces and will make piracy a no-reward venture.

Ahl founded Creative Computing Magazine *and is the author of more than 20 books on recreational, educational and professional computer applications.*

The information business: Captivating and confounding

Think of yourself as a strategic planner for a hardware manufacturer, and the internal think-tank talk has turned from the annoying present — networking, systems integration, software services and desktop publishing — to the imminent future. You are now charged with dusting off the crystal ball and coming up with a clear vision of the concepts that will drive the company into the next century.

A difficult task, but, if you are IBM, Digital Equipment Corp., AT&T or even Apple Computer, Inc., you have a ready answer: information. Your company is in the business of solutions, you say, and you need to bundle your hardware and software with information services. It's nothing more than taking systems integration, networking and software services a step further.

Given the logic of such a strategy — a logic that all four found irresistible — why have all these vendors stumbled so awkwardly in the information business?

IBM took the joint-venture route with name-brand partners: International Marketnet Service, the brokerage automation joint venture with Merrill Lynch & Co., has been a dud to date; CBS, Inc., IBM's joint-venture partner with Sears Communication Network, Inc. in Trintex Co., the consumer videotex service, has pulled out of the project.

A familiar role

DEC tried to become a publisher of compact-disk/read-only memory (CD-ROM) titles but abandoned the publishing business per se in favor of the more familiar role of supportive vendor.

AT&T tried and failed twice, first with a real-estate information service and then with a joint marketing agreement with Quotron Systems, Inc., which was discontinued when the financial quote provider was acquired by Citicorp, N.A.

GUEST OPINION

By MICHAEL A. CONNIFF

IBM seems to bring its own brand of elephantiasis to the information business. DEC, a dutiful cow oudging its calves, tries to push technology along, at times to its own near-term detriment. AT&T's response to the information business is invariably Pavlovian, salivating for the T-bone steaks regulators say they can't have.

Why can't the vendors stay away? By all estimates, the information business still promises the open-ended growth now a distant magnetic memory in the vendors' past. They look at the chocolate-covered nougats like CD-ROM, consumer videotex and financial information services, and they can't keep their hands off.

Perhaps the demise of information services at Apple, where all things seem magnified, is the most instructive. Desktop publishing and desktop communications have dominated the publicity emanating from Cupertino, Calif., but Apple has also devoted resources to "desktop information."

Apple Information Services, under the leadership of an Apple vice-president, consisted of 15 people dedicated to Apple proselytization in the information industry. Apple evangelists spoke of the wonder of the Macintosh user interface as a data retrieval tool. Apple dispatched 10 people, including a business development consultant, marketing manager, director of engineering, network operations manager, software manager, vice-president, software engineer and manager of software engineering, to a small information industry conference on CD-ROM.

But there was a problem — desktop information wasn't really at the heart of their business. Apple Information Services was soon scrambling for matching funds from outside the company that would enable the unit to become a separate subsidiary — and to eventually enter the world of MS-DOS-based software.

Disbanded and dispersed

"We almost got the money," said one former Apple employee. Times-Mirror Co., the newspaper, cable television and publishing powerhouse, almost bought in. But it was not to be. Apple Information Services has been disbanded, its employees dispersed throughout the company or dispatched in search of other non-Apple work.

If vendors observed a few simple rules, they could save their companies time and resources:

- Don't get taken in by the glamour and growth of the information business. It is a complex and confounding field, even for executives with experience under their belts.
- Resist the impulse to establish equity positions with brand-name companies just because it looks good on paper.
- Pursue strategic marketing agreements that don't encourage the establishment of an entirely new and impenetrable bureaucracy.

Conniff is a consultant based in Burlington, Vt.

VIEWPOINT

Continued from page 16

making incremental "footprint" announcements in terms of system performance as we meet our three-year commitment. We are, however, just as committed to the software side of parallelism as we are to the hardware side, and will continue to place major emphasis on our operating system development.

Kenneth H. Goldner
Director
Industry Marketing
Encore Computer Corp.

Classifying processing

As the article, "Parallel processing" [CW, Dec. 22], points out, there are many definitions of parallel processing. Actually, you can throw in the concepts of vector, array, multi- and matrix processors.

Unfortunately, the major problem is that people confuse parallelism in processing with parallel processors. I have an IBM Personal Computer XT microprocessor with an 8087 match coprocessor that can process simultaneously but is not a parallel processor.

I disagree with IBM that the project is a parallel processor. I feel that it actually is a vector processor. Also, I don't think the delineation should be as large a mystery as is stated. A text book called *Computer Architecture and Parallel Processing* by Hwang and Briggs presents a technical analysis of parallel and vector architectures.

They state three schemes were devised to classify computer architectures. Flynn (1966) bases his classifications on the multiplicity of instruction and data streams in a computer system. Feng's scheme (1972) is based on serial vs. parallel processing. Handler's classification (1977) is determined by the degree of parallelism and pipelining in various subsystem levels.

All of the classifications would consider the IBM GF11 processor a multiexecution unit — or single-instruction, multidata stream — vector processor. Only one instruction is decoded by one control unit at a single point in time. It is acted upon by execution units, not processors. The execution unit only carries out the single instruction. It has no control unit and therefore can't decode its own instruction.

A parallel processor would incorporate multiple processors, each of which is composed of a control unit and an execution unit. Multiple instructions would simultaneously be decoded and sent to their own execution units.

As a person who is trying to understand the subject, I will welcome all articles that are as interesting and thought-provoking as this.

Tony Jeffcott
Vice-President, Technology
Intech Leasing Corp.
Stamford, Conn.

Ametek's applications

The feature story, "Parallel processing" [CW, Dec. 22], did a fine job of addressing the issues of multiprocessing, but the research into commercial vendors unfortunately omitted a number of major players, including Ametek, Inc.

Had Ametek's System 14 not been omitted from the story, readers would have learned about an Intel Corp. 80286-based parallel processor that was commercially available in 1986. Important applications in technical and commercial markets include physical simulations of heat flow, oil fields, transsonic aerodynamics and a wide variety of Fast Fourier Transfer applications.

Al Kernek
Manager, Marketing and Sales
Ametek
Arcadia, Calif.

Open systems problem

I must confess that I found John L. Kirkley's Viewpoint, "Friendly vs. forward-looking: The Mac and AT square off" [CW, Dec. 22], highly amusing. "Friendly vs. forward-looking?" At least on the Macintosh, desk accessories know how to live with each other. He offered an interesting comparison — an enthusiastic user eager to show off what can be done now with a Macintosh and an equally enthusiastic tech wizard saying, in effect, "Look what we'll have in a year or so!"

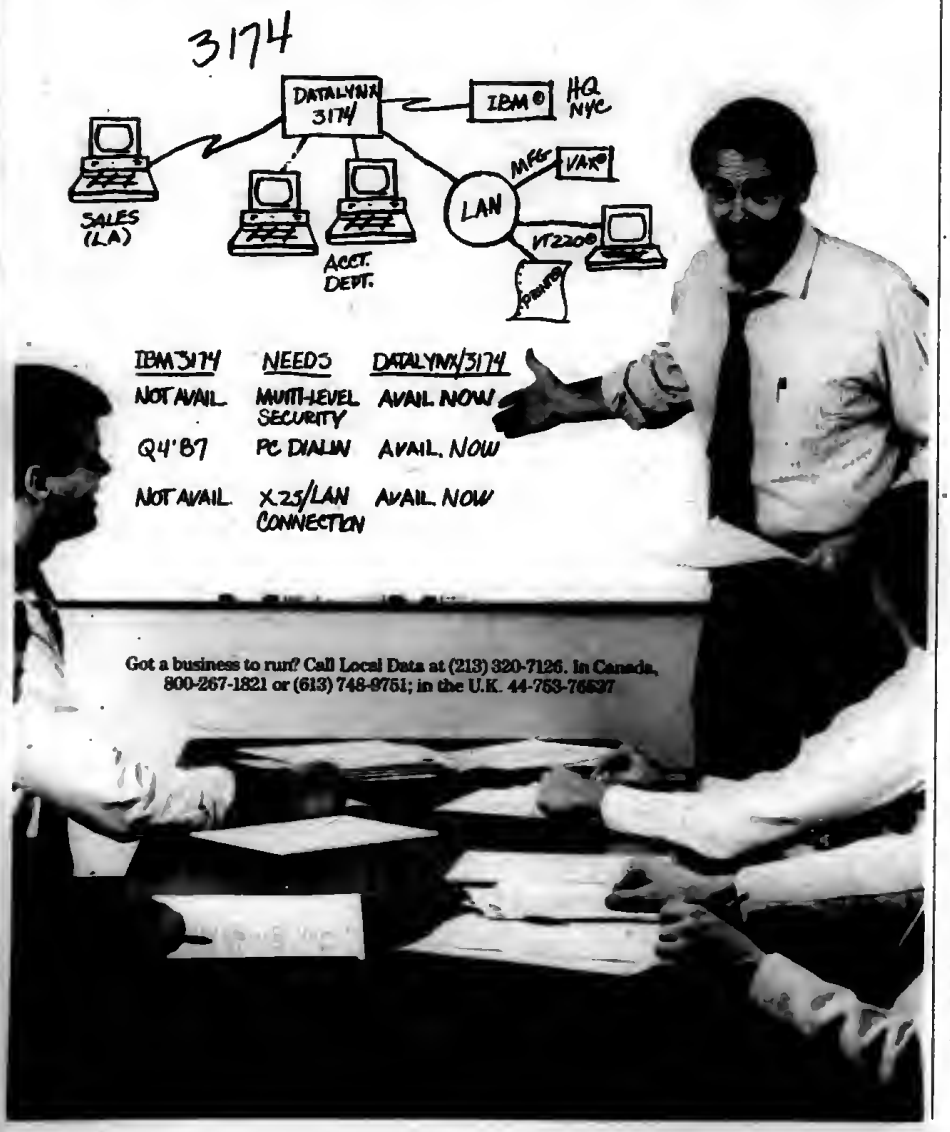
The point of contention seems to be open vs. closed operating systems. The Mac system is closed because it has few optional parts. In fact, if it even has a name, it's managed to escape me. The Microsoft Corp. MS-DOS system is open because it has a plethora of optional parts.

There's only one thing wrong with the open idea. The Mac system already has the parts needed to supply user-friendly software in a standardized graphic environment. To achieve the same thing under the IBM/MS-DOS architecture, one must first shell out enough money for graphics peripheral equipment to have bought an Atari Corp. ST or Amiga, then call the MS-DOS wizard to patch the peripheral drivers into DOS and hope the graphics applications work together. If this seems extreme, remember that MS-DOS is a direct descendant of an operating system that was intended to run on a 20K-byte, nongraphics, 8080-based microcomputer.

To the gurus, the Mac system may appear limited, but the Mac users seem to be pretty happy on the whole. They could care less about what DOS does or doesn't have, technically speaking, so long as the job gets done. If a system with an extendable, multitasking DOS with integral color graphics and a mouse is what you need today, go out and buy an Amiga.

Tim Holloway
Principal Associate
MTS Associates
Jacksonville, Fla.

The Choice Is Simple! Local Data.



ACCESS IDMS/R. RAND McNALLY DID.

"We were looking for an information technology that would show us the short cuts. We found it with Cullinet's relational database – IDMS/R. I'm pleased to report that the system has made *all* of our various businesses much more cost-effective operations."

Andrew V. McNally IV
President
Rand McNally & Company

Mapmaker. Book publisher. Printer. Manufacturer. Market Researcher. Rand McNally is all of them. And to succeed as a major diversified corporation, they had to map out an information management strategy that would work both today and down the road.

That's why Rand McNally turned to Cullinet's IDMS/R. Its state-of-the-art, relational architecture allows them to maintain enormous databases. IDMS/R provides an integrated base supporting Cullinet's broad applications software – including inventory control, bill of materials, credit and order entry. They have already developed their own custom applications through ADS/OnLine, Cullinet's unique fourth-generation programming language.

Cullinet's solution is based on an integrated technology that performs. So companies like Rand McNally can simultaneously check inventory levels, confirm pricing and verify credit history – instantly. It's an information management system that'll keep users on strategy, keep them headed in the right direction.

For more information on how your company can access Cullinet through IDMS/R, call toll-free 1-800-551-4555. In Massachusetts, call 617-329-7700. Or write to Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, MA 02090-2198.

Cullinet

An Information Technology Integrator
For The 80s, 90s And Beyond.

THE SAS®

Fourth Generation Software

Now there's one software solution for all your Information Center needs. One solution for all your applications, for all your mainframes, minicomputers, and microcomputers. One solution—the SAS® System.

One Solution to Integrate All Your Computing Tasks.

The SAS System gives you efficient data management, superior statistical tools, an easy report generator, customized presentation graphics, and more. Choose between the simple English-like command language or a front-end menuing system with fill-in-the-blank screens. On-line help facilities make it easy to handle every application, quickly and accurately.

You can track sales leads, manage prospect files, determine market share, and present results with the SAS System. Plus you can file employee and applicant records, analyze benefit programs, and manage the payroll. The SAS System can handle all your accounting applications, and produce spreadsheet reports automatically.

That's not all. With the SAS System, you can take orders, keep inventory, and produce mass mailings. Schedule projects, determine product mix, and make forecasts. Your [illegible] can measure hard-

SYSTEM

for Your Information Center.

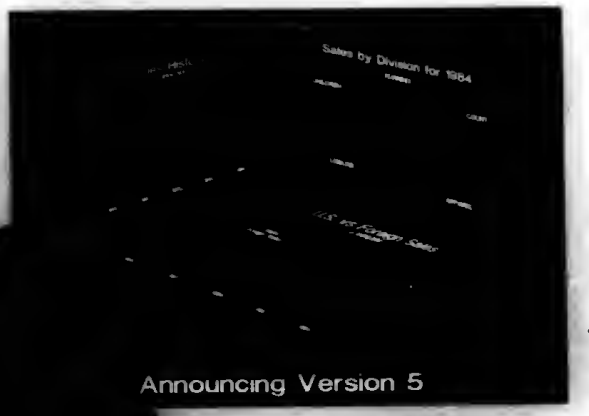
ware resources or system usage, test data bases, and run production programs.

One Solution that's Friendly.

It's simple with the SAS System. You can write front-ends for all your SAS applications. With just a few keystrokes, you can modify the applications as your information needs change. One language handles all your tasks. And if you need to move between several operating systems, you'll find the language, syntax, and commands the same for the mainframe, minicomputer, and PC SAS System.

One Solution with Full Support.

Training is easy too. We offer instructor-based, video-based, and computer-based training. Technical support is provided for our mainframe, minicomputer, and microcomputer users, and documentation comes with your system.



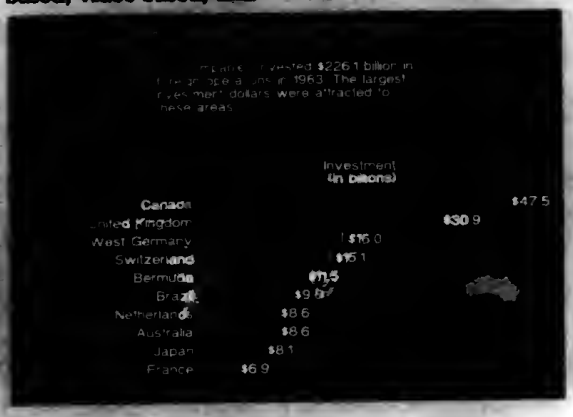
Call us today. International customers, call the International Marketing Department for information on your local distributor.

Whatever your application, the SAS System is your solution.

SAS.

SAS Institute Inc.
SAS Circle, Box 8000
Cary, North Carolina
27511-8000, USA.

(919) 467-8000, x280
Telex 802505



The SAS System runs on IBM 370/30xx/43xx and compatible machines under OS, TSO, CMS, DOS/VSE, SSX, and ICCF; on Digital Equipment Corp. VAX™ 8600 and 11/7xx series under VMS™; on Prime Computer, Inc. Prime 50 series under PRIMOS®; on Data General Corp. ECLIPSE® MV series under AOS/VS; on IBM XT/370 and AT/370 under VM/PC; and on IBM PC XT and PC AT under PC DOS. Not all products are available on all operating systems.

SAS is the registered trademark of SAS Institute Inc., Cary, NC, USA. VAX and VMS are trademarks of Digital Equipment Corp., Maynard, MA. PRIMOS is the registered trademark of Prime Computer, Inc., Natick, MA. ECLIPSE is the registered trademark of Data General Corp., Westboro, MA.
Copyright © 1985 by SAS Institute Inc. Printed in the USA.

We designed our V.32 modem on the premise that speed is useless without reliability.

At Codex, we understand that all the speed in the world won't get you anywhere if you can't depend on it. And that's why we developed our V.32 modem to give you 9600 bps full-duplex dial transmission, rivalling the reliability of a dedicated leased line.

Admittedly a pretty big claim.

But then, it's really what you'd expect from the recognized leader in high speed modems. In fact, more data communications professionals prefer Codex than any other brand.* And it's our high speed modem expertise that has allowed us to make a modem that not only meets, but exceeds the V.32 standard.

Our V.32 modem uses the same VLSI technology and forward error correction scheme (Trellis Coded Modulation) as our high speed leased line modems that reliably transmit data up to 19,200 bps.

So, you can be sure of continuous high quality transmission over a wide range of line conditions. This now allows you to cut connect time and save money by sending data at up to 9600 bps full duplex over ordinary dial lines.

We've even added a proprietary long haul echo cancellation feature, eliminating both local and distant echoes that can plague dial networks. So even if the phone company sends your data over satellite links, it arrives intact.

Plus our V.32 modem includes a soft strap front panel, multiple ACUs, a nest card option for maximum space savings, and operates in synchronous or asynchronous applications.

To find out more about the Codex V.32 modem, call **1-800-426-1212**, Ext. 235. Or write Codex Corporation, Dept. 707-35, 7 Blue Hill River Road, Canton, MA 02021-1097. You'll discover that when we tell you about a V.32 with high speed performance and reliability, we're not blowing smoke.

codex

MOTOROLA

Visit Codex booth #642 at the Communications Network show, February 10-12.

*McGraw-Hill's *Data Communications* Brand Preference study cites Codex as offering the best technology, best price performance ratio, best service organization, and most informative literature for various modem, multiplexer and network control product categories. © 1986 Codex Corporation. Motorola and Ⓜ are trademarks of Motorola, Inc. Codex is a registered trademark of Codex Corporation.

NETWORKING

DATA STREAM
Walter Ulrich
and Elisabeth Horwitt

Reflections on a hectic year

The three-year period ending at midnight Dec. 31 was the most hectic in the history of the communications industry. During that time, communications managers had to learn to deal with the divestiture of AT&T and the subsequent regulatory and market confusion as competition intensified and vendors sought new fields of endeavor.

Of those three years, the last was particularly hectic. New technologies emerged. Several promised breakthroughs even became commercially available. Industry segments experienced repositioning, growth and shakeout. Users had trouble keeping track of it all. Here, in broad strokes, is the communications industry of 1986:

With profits down 12% in the first nine months, IBM had a tough year. Nonetheless, Big Blue announced communications-related products at a stunning rate. Among the most significant are PC Netview and the 9370. PC Netview could be looked at as IBM's Trojan horse: Promising a network management interface standard, it puts Big Blue in control of other vendors' telecommunication equipment.

The 9370 is part of IBM's counterattack against Digital Equipment Corp. in the departmental processor and networking arenas. Not only does the low-end system fill in an important gap in IBM's office systems strategy, but it

See **REFLECTIONS** page 25

Ulrich is president of Houston-based management and technology consulting firm Walter Ulrich Consulting. Horwitt is Computerworld's *senior editor, networking.*

Multiport transceiver out

Terminals, PCs to gain fiber-optic connectivity

By Stanley Gibson

ROANOKE, Va. — Fibercom, Inc. announced last week a multiport version of its Whisperlan transceiver that provides a cost-effective way for IBM Personal Computers and terminals to communicate over the company's fiber-optic-based Ethernet local-area network (LAN), according to Albert Bender, Fibercom president.

Whisperlan/MPT supports up to eight asynchronous devices at a cost of $225 per Ethernet connection, as compared with the original Whisperlan transceiver, which connects one device at a cost of $750, Bender said.

Whisperlan/MPT is not a network server on which a group of devices share access to one network connection; rather, it is a segment of a fiber-based IEEE 802.3 Ethernet: "A LAN in a can," according to Bender. This means that devices connected to a transceiver can talk to one another just through the transceiver or transmit to other nodes on the greater Ethernet LAN.

"The multiport transceiver will make Whisperlan appealing to the PC world," Bender said, adding that he believes the product will be attractive to businesses for connecting PC LANs to fiber-optic backbones.

An existing Ethernet PC network, as well as single Ethernet devices, can connect to a Whisperlan/MPT port, according to Bender.

Each Ethernet device can be located 150 feet from a transceiver.

Whisperlan/MPT is intended to work with Whispernet, Fibercom's product that implements standard 10M bit/sec. Ethernet over fiber-optic cable. However, Bender said all Whisperlan products are fully compatible with Digital Equipment Corp.'s

See **MULTIPORT** page 25

Hybrid cabling system debuts

By Patricia Keefe

MORTON GROVE, Ill. — Taking its cue from IBM, AT&T and Digital Equipment Corp., Northern Telecom, Inc. introduced its version of a uniform building network wiring scheme employing a combination of fiber-optic cable and standard twisted-pair wiring.

Called Integrated Building Distribution Network (IBDN), the Northern Telecom scheme is similar to those of its competitors. "Let's face it, the wire topology and basic connection technology is set by the 100-year-old telephone network," said Robert Newton, program director of local-area communications for the Gartner Group, Inc. in Stamford, Conn. During the next five to 10 years, he predicted, building wiring schemes will move toward fiber-optic only.

The building wiring schemes, according

See **HYBRID** page 24

Comsat, ITT unveil overseas satellite links

By Elisabeth Horwitt

ITT World Communications, Inc. in Secaucus, N.J., and Comsat International Communications, Inc. in Washington, D.C., have announced what reportedly are the first digital satellite-based overseas services between the U.S. West Coast and the Pacific Basin countries.

ITT's Worldsat service, unveiled earlier this year, now offers satellite-based connections between the U.S. and "any country served by Intelsat Business Service," said Beth Enrich, Worldsat product manager. Intelsat Business Service is a consortium of European carriers offering international satellite-based services.

Worldsat offers links between the West

See **OVERSEAS** page 24

INSIDE

First field trial of the ISDN primary rate interface begins/**24**

NEW THIS WEEK

- Server Technology offers Netbios-compatible version of its Easylan network software
- For more on this and other new products, see pp. 59-62.

INSTANT ANALYSIS

"Everyone and his brother is trying to say that what his company is doing is Open Systems Interconnect."

— Vick Boersma, manager, technical requirements, technology and standards, Northern Telecom, Inc.


```
printf("Hello, MAINFRAME world\n");
```

Meet the Industry's New Standard for Mainframe C Compilers

SAS Institute Inc. announces a mainframe version of the Lattice® C compiler—your key to truly portable applications.

With our compiler, you can develop C programs on IBM 370 machines, interface easily with non-C programs and software packages, and protect your programming investment across operating environments. Virtually every new computer supports C, and portable programs created with the mainframe compiler under OS or CMS will run on any other machine with a C compiler.

The mainframe compiler uses standard IBM linkage conventions. Assembler programs, MAIN routines in other high-level languages, and packages such as IBM's ISPF and GDDM can be invoked directly from C. And you can use C, instead of assembler, to develop small and fast subroutines called from other languages.

We designed the compiler listing and cross-reference to make programs easy to follow and errors easy to find. An extensive library offers functions from Kernighan and Ritchie and the Lattice PC C compiler. The run-time library produces explicit numbered error messages and a traceback of active function calls if an error occurs.

For all the facts—including details on economical annual licensing complete with free technical support and enhancements—call your Software Sales Representative today.

SAS is a registered trademark of SAS Institute Inc. Lattice is a registered trademark of Lattice Inc.

Copyright © 1986 by SAS Institute Inc. Printed in the USA

SAS Institute Inc.
Box 8000 SAS Circle
Cary, NC 27511-8000
Phone (919) 467-8000
Fax (919) 469-3737

Overseas satellite links unveiled

From page 23

Coast and either Europe or the Pacific Basin and between the East Coast and Europe. Comsat, which already offered East Coast-to-Europe services, recently added a West Coast-to-Far East offering. Customers in other parts of the country will be able to access the Far East gateway in San Francisco through Comsat's domestic network, according to Eric Novotny, Comsat director of new business development.

Both ITT and Comsat are implementing coast-to-coast terrestrial links to supplement domestic satellite-based connections. A terrestrial link is necessary for data and voice communications applications that cannot tolerate transmission delays that occur during the double satellite hop needed for an East Coast-to-Far East connection, for example, Novotny explained.

Comsat's West Coast-to-Far East services will offer rates comparable to the U.S.-to-Europe offerings, Novotny said. Typically, a 56K bit/sec. line between the East Coast and a European country costs $5,000 per month for Comsat's portion of the link and approximately the same amount for the European carrier's portion.

ITT charges $4,250 per month for its portion of a 56K bit/sec. or 64K bit/sec. overseas link.

Both Comsat and ITT's overseas offerings are based on the Intelsat Business Service. Both support digital transmissions of voice, data, video and facsimile at rates of up to 1.5M bit/sec. or 2M bit/sec., depending on the variety of T1 standard available in the destination country.

Hybrid cabling system debuts

From page 23

to Newton, are loss leaders for switch makers hoping to sell equipment to users. "All the people who sell structured wiring systems are basically losing money on it," he said, adding that money is made on the installation of cable.

The hybrid cabling system used in Northern Telecom's IBDN allows terminals and computers to communicate with each other exactly as they would over coaxial cable with no degradation in speed, according to William J. Viviano, vice-president and general manager of Northern Telecom's Cook Electric Division, a telephone equipment and peripheral computer products firm.

Under the IBDN plan, twisted-pair wiring up to a distance of 2,000 feet would support a Northern Telecom Meridian SL-1 integrated services network with a distribution speed of 2.56M bit/sec. A combination of twisted-pair and signal converters would be used to accommodate such systems as IBM's 370 at 2.35M bit/sec. and System/34, 36 and 38 at 2.4M bit/sec.

The plan also includes software enhancements for planning, engineering and cable management.

GTE, Mountain Bell test ISDN primary rate

By Elisabeth Horwitt

PHOENIX — GTE Communications Systems Corp. and divested Bell operating company Mountain Bell last week began what reportedly is the first field trial of the Integrated Services Digital Network (ISDN) primary rate interface.

The primary rate defines 23 64K bit/sec. channels plus one 64K bit/sec. or 16K bit/sec. D channel that carries signaling information. It was designed to link digital private branch exchanges, communications processors and other devices that perform high-volume communications, according to Mountain Bell spokesman Robert Meldrum.

The trial involves the transmission of digitized voice and data between a GTE central-office digital switch at a Mountain Bell office in downtown Phoenix and a private-network switch located at GTE headquarters in North Phoenix, about 13 miles away. The use of fiber-optic cable connections between the two sites allows transmission over that distance, Meldrum said. Other site trials have involved distances of only a few miles, he added.

'Using ISDN to streamline'

GTE and Mountain Bell will be participating as ISDN customers during the trial, using ISDN primary- and basic-rate interfaces as part of their internal communications systems. "From our perspective, we're using ISDN to streamline our communications," Meldrum said. The trial is one of six scheduled for this year by regional holding company U.S. West.

The next site trial planned by U.S. West, scheduled to start in February, will be an internal test involving five Mountain Bell locations in the Denver area, according to Meldrum. The trial will test ISDN networking over a digital adjunct switch attached to an ordinary analog central office switch.

Other ISDN trials have used digital switches, "but most central office switches out there are analog, and it would be too expensive to convert to all digital; so this is an important test," he added.

Now use your computers to create, fill in and distribute all your company's forms. And save your company millions.

Your computers have given your company paperless typing, paperless filing, and paperless mailing.

Now the paperless *form* is here, the "electronic form." It's already working in hundreds of installations worldwide and creating a virtual revolution in productivity.

Create, process and manage forms on your computers.

The technology of Electronic Form Systems integrates form creation, processing *and* management. So everything your employees do with paper forms, they can now do with electronic forms. But with much greater efficiency.

They can fill them in. Route them. Approve them. Revise them. File them. Even distribute copies. And when printed out on paper, electronic forms look like the forms they use now.

Create new forms for less.

Now, when someone in your company needs a form, they set type, they do artwork, and they get it printed. It takes weeks.

But a new electronic form can be created *and used* in less than two hours. It's done on a Formcoder workstation, and it doesn't take a programmer; a good word processing operator can do it.

The new form can be sent to field offices through your computer network. The expense of shipping paper forms between offices is eliminated.

Cut storage and inventory costs.

Electronic forms are stored in your system so most of your company's present cost of forms inventory and warehousing can go right to the bottom line. You can store as many as 5,000 different forms on an IBM Personal Computer AT® or PC XT®, an unlimited number on your mainframe.

One major insurance company projects annual savings of $1.8 million in warehousing costs alone.

With electronic forms, supply always equals demand.

Your company will never run out of

Reflections on a hectic year

From page 23

is also the first IBM host to directly support non-IBM communications protocols such as Ethernet and Transmission Control Protocol/Internet Protocol.

IBM's joining the Corporation for Open Systems was another strong sign that the company will not stand aloof from the standards evolution.

Superior financial performance plus a string of solid product announcements made DEC the darling of the financial analysts and the consulting community. Major DEC networking announcements in 1986 included centralized network management tools and better integration of the IBM Personal Computer with the VAX VMS environment through the Vaxmate. DEC also took the lead in Open Systems Interconnect (OSI) support, completing its seven-layer OSI suite with an X.400 electronic mail interface.

Supporting major architectures

Wang Laboratories, Inc., Hewlett-Packard Co., Data General Corp. and the rest were not far behind in announcing support of the two major communications architectures: OSI and IBM's. The announcements of LU6.2 support have been deafening, but users still await real applications that will make peer-to-peer networking under Systems Network Architecture a reality.

With the merging of Sperry Corp. and Burroughs Corp. into Unisys Corp., the obvious next step will be the integration of the two vendors' product lines.

AT&T did a great job on communications technology but has fared poorly in the marketplace. At the end of the year, AT&T announced a $3.2 billion write-off and the elimination of more than 27,000 jobs. Of course, AT&T's major competitors, MCI Corp. and U.S. Sprint Communications Co., also announced write-offs and/or losses last year and are clearly feeling the pressure of AT&T's rash of rate cuts.

FCC eased up

The Federal Communications Commission eased up considerably on AT&T and the divested Bell operating companies. AT&T Communications and Information Systems divisions now can jointly market and support their products. AT&T and the regional carriers now can use one accounting system for regulated and nonregulated ventures, provided they can satisfy the FCC that no cross-subsidization is taking place.

Everyone talked up Integrated Services Digital Network (ISDN), and in November, the first ISDN trial was initiated in Phoenix. AT&T claims that it will offer true ISDN services this year, but subcommittees are still struggling to reach a consensus on protocols, and general availability is slated for 1988.

The time for reflection is gone. The new year is a time to put strategies in place and tactics into action. The manager who fails to play by the new and ever-changing rules of the communications game will be reading the want ads before the year is out.

With the Formcoder Workstation you can create electronic forms that look like your paper ones. It doesn't take a programmer, a good word processing operator can do it. The workstation is based on the IBM Personal Computer AT.

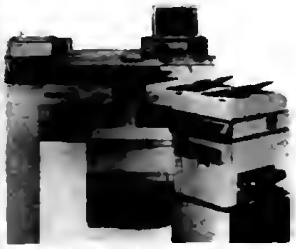
electronic forms. So employees don't waste time and delay revenue trying to replenish form supplies. Supply always *equals* demand — exactly.

One major insurance company produces 15,000 policies every night using electronic forms. They are never short a single policy page.

Obsolete forms no longer waste your company's money.

Needs change, laws change, and suddenly a lot of your paper forms aren't worth the paper they're printed on. One major bank estimates that out-of-date forms were costing them $35,000 per month.

Electronic forms eliminate this waste entirely. When a form goes out of date, you just move it to another computer file and put the new one in its place.



Laser printers print the form and the information that goes on it at the same time. No one has to align paper forms in an impact printer, then burst, assemble, and collate.

More accurate and efficient data entry.

Electronic forms can improve the quality of data.

Data entered for an electronic form can be transferred to your mainframe. In many cases, that means you can eliminate the tedious and error-prone step where someone copies information off a paper form and enters it. The person who fills out the form has *already* entered it. Data is captured at the source, and some of the people who now do "heads down" data entry can be reassigned to more productive tasks.

Finally, break the speed limit of paper.

Electronic forms are faster.

They can be filled in faster. The computer can automatically fill in standard information like a customer's address. When the same information goes on several pages, you enter it once; the computer puts it in all the right places. (A title company went from six sets of documents per person per day to thirty-six.)

Electronic forms can be printed more efficiently. Laser printers print the form and the information that goes on it at the same time. *Nobody has to align paper forms in an impact printer, then burst, assemble, and collate.*

And electronic forms get where you want them to go faster than paper ones. They go through your network instead of interoffice mail.

Works with your existing system.

Electronic forms can be used with the computers you already have. They work in your IBM environment with your existing applications software. You don't have to turn your department upside down or scrap any of your present applications investment to start using them.

You can implement electronic forms as a centralized system based on your IBM® mainframe or a distributed system using IBM personal computers. And you can use many different brands of printer.

Liberate your company's forms from paper.

With electronic forms, you can streamline thousands of tasks and make your forms the efficiency tools they were intended to be.

Send for free information.

Call 1-800 FORM-FREE. Or fill out the coupon below.

Electronic forms. They do everything your paper ones do. Without the paperwork.

Send me more information on electronic forms.

Name _____

Title _____

Company _____

Type of business _____

Address _____

City _____

State _____ Zip _____

Phone _____

Complete and mail to:

Electronic Form Systems
2395 Midway Road
Carrollton, TX 75006
ATTN: EFS Marketing Manager

Or call 1-800 FORM-FREE

ELECTRONIC FORM SYSTEMS™

EFS.™ A Product of Computer Language Research, Inc.

Electronic Form Systems is a division of Computer Language Research, Inc. IBM, IBM Personal Computer AT, and IBM PC XT are registered trademarks of International Business Machines.

Multiport transceiver out

From page 23

Decnet, Lanbridge 100 and Decconnect. In addition, he said the system works with AT&T's Premises Distribution System wiring scheme and IBM's Cabling System.

One of Fibercom's early customers, Tennessee Technological University in Cookeville, installed a fiber-optic backbone composed of eight Whisperlan transceivers to connect a seven-building campus. From each transceiver, Ethernet cable runs to DEC Delni boxes and from there to DEC terminal servers.

The Whisperlan/MPT replaces the DEC Delni and single-port Whisperlan in configurations such as the one described above, according to Kevin Hamilton, Fibercom applications engineer. The Delni is an eight-port concentrator to which eight Ethernet devices can connect.

A possible drawback of the network is that network operations are interrupted each time a node is added. However, network switches and multiport transceivers can be installed strategically so that nodes can be added as work-area networking needs grow, Fibercom's Bender said.

Among the advantages offered by the network are greater maximum distances between nodes and the elimination of repeaters that are necessary components of coaxial cable-based Ethernets, Bender added.

Fibercom may introduce Manufacturing Automation Protocol or IEEE 802.5 token-ring transceivers in the future, according to Bender.

Whisperlan/MPT costs $1,800 and will be available for shipment in 60 days. At $1,800 per node, eight devices can connect at $225 each. A single-port Whisperlan costs $750.

Data Model

PC based Tools
- Entity Relationship Diagrams
- Normalization of Relations
- Data Base Schema Generation

Consulting & Training

Chen & Associates
1081 Constitution
Suite 1E
Baton Rouge, LA 70808
(504) 388-2482

INGRES SEMINAR

Is the data you need distributed across multiple computers?

With INGRES, you get a truly distributed database. INGRES works across multiple operating environments from mainframes to minis to PCs.

And with INGRES you can build applications and share data that span multiple computers just as easily as if all the data were located on one machine.

Users don't have to worry about where the data is located, how to get it or what type of hardware and operating system are used. Your entire company uses one powerful DBMS with consistent reliable results.

Do you need greater productivity in developing applications?

Only INGRES gives you a comprehensive application development environment. With a 4GL that includes SQL, a Visual-Forms-Editor and interfaces to traditional programming languages. This will increase your organization's productivity by leaps and bounds.

Your end-user will find INGRES easy to use too. Whether they want to create forms, queries, reports or graphs. And using INGRES/PC LINK, end-users can download host INGRES data for use with products like Lotus 1-2-3 and dBASE.

Is performance important in your SQL applications?

The heart of INGRES is a high-performance SQL relational database management system.

INGRES is uncommonly fast. INGRES provides special support for transaction processing and complex queries. And INGRES is compatible with DB2.

If you answered "YES" to any of these questions, register for a FREE INGRES Seminar by calling (800) 4-INGRES.

AL	Huntsville	Jan 15
AZ	Phoenix	May 27
	Tucson	May 14
CA	Irvine	Mar 3
	Los Angeles	Jan 29
		Apr 22
	Sacramento	Jan 13
		May 13
	San Diego	Mar 10
	San Francisco	Jun 18
		Jun 24
	San Jose	Feb 18
		Apr 29
CO	Denver	May 14
CT	Hartford	Apr 7
	New Haven	Feb 25
	Stamford	Jan 6
FL	Melbourne	Mar 24
	Tampa	Jan 6
GA	Atlanta	Jan 20
IL	Chicago	Feb 12
IN	Indianapolis	Feb 24
LA	New Orleans	Jun 10
MA	Boston	Feb 11
	Burlington	Jan 14
		May 28
	Cambridge	Apr 22
	Newton	Mar 26
MI	Detroit	Mar 17
MN	Minneapolis	Feb 5
MO	Kansas City	Mar 4
	St. Louis	Feb 18
NC	Charlotte	Mar 10
	Research Triangle Pk	Feb 3
NE	Omaha	Jan 22
NJ	Iselin	Mar 4
	Princeton	Jan 27
NY	Albany	Feb 18
	Rochester	Jan 28
OR	Portland	Apr 28
PA	Pittsburgh	Mar 19
RI	Providence	Mar 11
SC	Columbia	May 26
TN	Memphis	Apr 14
TX	Austin	Apr 8
	Dallas	Mar 12
	Houston	Mar 26
UT	Salt Lake City	Feb 10
WA	Bellevue	Jan 27
	Seattle	May 6
WI	Milwaukee	Jan 8
	Canadian Seminars:	
BC	Vancouver	Feb 12
ON	Edmonton	Mar 19
	London	Mar 18
	Ottawa	Jan 14
	Toronto	Feb 4
		May 6
NS	Halifax	Mar 5
QB	Montreal	Feb 19
	Quebec	Mar 24

© 1987 Relational Technology.
INGRES, INGRES/PC LINK and Visual-Forms-Editor are trademarks of Relational Technology.
Lotus 1-2-3 is a trademark of Lotus Development Corporation.
dBASE is a trademark of Ashton-Tate Corporation.
DB2 is a registered trademark of International Business Machines Corporation.

(800) 4-INGRES
Canadian Seminars,
(415) 748-3444.

INGRES
Relational Technology
1080 Marina Village Parkway
Alameda, California 94501

1986 and 1987 Digital Review Target Award Winner

SOFTWARE & SERVICES

SOFTALK
Charles Babcock

Restructuring roundtable

In the debate on Cobol restructuring that took place recently in Chicago, it was clear that certain benefits accrue to those who take the restructuring approach.

Restructuring amounts to constructing a heirarchical or tree-like structure out of the tangled Cobol that sometimes travels under the epithet spaghetti code. A restructuring program will analyze the application, eliminating recursive logic, premature exits or backward jumping loops. The aim is to get a program that functions the same as an unstructured program but is much easier to read and maintain.

IBM endorses the concept of restructuring and has issued its own product, Cobol/SF, but it only works on VS Cobol II, a thinly installed version of the language. IBM refused to send a speaker to the debate because it was being videotaped, according to a spokesman for the organizer, Peat, Marwick, Mitchell & Co.

While there was agreement on the benefits of restructuring, there was little agreement on approach. At times, it seemed as if the contrast evident in the personal style of the three debaters was carried through to the products they had written as well.

Eric Bush, the young and professorial chairman of Language Technology, Inc., showed the surest wit and evinced the most cerebral approach to restructuring; at times, it seemed as if the oversize mustache on Bush's face was just one more sign of his determination

See **RESTRUCTURING** page 28

Babcock is Computerworld's senior editor, software & services.

ADR updates 4GL offering

Claims improved speed, throughput, CICS activity

By Charles Babcock

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced the third release in 17 months of its fourth-generation programming language, Ideal, claiming it offers a 25% performance boost.

The claimed performance improvement comes on the heels of a 35% performance increase cited by ADR in the previous release last April. Users of the IBM CICS application-oriented fourth-generation language, such as L. L. Bean, Inc. of Freeport, Maine, claimed a gain of as much as 65% in execution time with that release. Together, the two releases reflect a 100% improvement in system throughput, according to Joseph W. Farrelly, vice-president for research and development at the mainframe systems house, located here.

A spokesman for ADR said the performance improvement stemmed from shortening the instruction path for the parts of the language that were most consumptive of machine resources, improving its ability to interact with the CICS environment and reducing I/O requirements.

Farrelly said Release 1.4 puts compiled Ideal programs and panel definitions into operating system load modules rather than Ideal's own library. The load modules have been link-edited and can be managed directly by CICS, reducing the amount of communications needed between Ideal and CICS, he added.

Farrelly said response time has been improved 20%, CPU utilization reduced 15% and temporary storage I/O cut 25%. The three combined yield an overall 25% gain in system throughput, he explained.

In addition, Release 1.4 incorporates commands that let a user automatically distribute an Ideal report over an ADR/Email network. Although the number of ADR/Email users is limited to 282, Farrelly said ADR thinks the importance of electronic mail will grow and that Ideal's usefulness is enhanced with the commands.

See **ADR** page 28

Users unsure of windows standard

By Rosemary Hamilton

While applauding their vendors' efforts to offer a standard windowing environment, some workstation users said last week they are not yet certain that the windowing system chosen, X Windows from MIT, would be their choice.

"It's nice that the manufacturers are actually agreeing on what could be a standard," said Mark Plotnick, a member of the technical support staff at the AT&T Bell Laboratories facility in Murray Hill, N.J. However, Plotnick said his department plans to evaluate both the X Windows system and the recently introduced Network Extensible Window System (NEWS) from Sun Microsystems, Inc.

"I haven't heard much about the vendors' announcement, but it sounds very nice," added Chuck Royalty, a technical staff member at Boeing Computer Services Co. "Assuming we adopt X, it would help the whole spectrum of things by letting us use software in other places."

Earlier this month, the major players in the technical and engineering workstation market — with the notable exceptions of IBM and Sun — announced a campaign for a standard windowing system. The group, which includes Digital Equipment Corp., Hewlett-Packard Co., Apollo Computer, Inc. and Data General Corp., said it intends to push for acceptance of X Windows as an international standard. By doing so, the group contends, there would be a standard environment in which windows could be displayed and to which applications could be written.

IBM did not participate, although a spokesman said the vendor is pursuing X Windows development efforts.

Some users said they will continue to review alternatives to X Windows. Tom

See **USERS** page 28

INSIDE

Unisoft package supports Berkeley and AT&T Unix/**29**

DEC broadens its Baseway sales/**29**

NEW THIS WEEK

- Interleaf offers Release 3.0 of its Technical Publishing Software
- Prime releases its implementation of Common LISP

For more on these and other new products, see pp. 59-62

INSTANT ANALYSIS

"VM was supposed to be a bridge to MVS. But VM has so much flexibility that some companies in the VSE world are turning to VM instead of MVS. That is something that IBM didn't fully anticipate."

— Donald W. Sullivan, general manager, Ucccl Corp. VSE Systems

Advertisement

Oracle launches ALLIANCE program for software VARs

Oracle Corp., supplier of the ORACLE distributed relational DBMS and application development tools, has announced a new program for software value-added relicensors dubbed the Oracle *Alliance* program. The program offers broader markets, simpler, faster selling cycles, and shorter time-to-market for VARs who build or convert their applications to use Oracle's products.

According to Larry Harman, Oracle's Director of the VAR program, "We offer major business benefits to VARs who choose to use ORACLE with their products. Chief among these benefits is ORACLE's portability and the portability of ORACLE-based applications, allowing applications and data to be shared among different machines. Oracle also provides the link software to exchange database information among the different machines."

Broader VAR Markets

ORACLE runs on the widest array of hardware. IBM mainframes under MVS and VM, most vendors' minis under both proprietary and UNIX operating systems, and PCs under MS/DOS. Oracle also developed SQL/RT, marketed by IBM on the RT PC.

Harman states, "Only with ORACLE can an application developer produce software on one system and *inherit* a vast market of users of multiple vendors' hardware. Basically, we let our software VARs do *blindfold selling*."

"Blindfold Selling"

The company described "blindfold selling" as the ability of a VAR's salesman to walk into an end-user site blindfolded and say, "I don't know what types of hardware you're using, or how many types there are, but my applications run on all of them."

Harman points out that VARs have a tough decision to make concerning what hardware to implement on. With ORACLE, that decision needn't be made. Software VARs who establish a niche in a particular vendor's install base can take advantage of ORACLE's portability to sell in other hardware environments.

Shorter Time To Market

The company also cited the high level of productivity offered to VARs by Oracle's broad range of application tools, including a forms system, integrated spreadsheet, graphics and other tools. These yield development and maintenance efficiencies that translate into shorter time-to-market and lower costs.

And, Harman adds, "ORACLE is the most complete and mature SQL-based DBMS on the market. SQL is becoming a national standard, so developing applications with an IBM-compatible, portable DBMS makes business sense in both private-sector and public-sector markets."

Harman concludes, "Generous discounts plus support, training and co-marketing combine to make the Alliance program an outstanding opportunity for software VARs."

Oracle Corporation, founded in 1977, builds and markets the ORACLE distributed relational DBMS, 4GL and DSS tools. ORACLE was the first commercial SQL-language DBMS, and is compatible with IBM's DB2 and SQL/DS DBMSs.

ORACLE provides a standard software environment across a wide range of computers and operating systems, including IBM mainframes, minicomputers from DEC, DG, ATT, HP, Stratus, IBM, Apollo and many others, and IBM PCs. ORACLE runs with IBM's MVS and VM/CMS, DEC's VAX/VMS and DG's AOS/VS among others, as well as with UNIX on most systems.

All versions of ORACLE, from the mainframe to the PC implementation, are identical. ORACLE is the only relational DBMS which provides the complete portability of data and applications across a wide variety of systems. Oracle's SQL*Star architecture links dissimilar systems running ORACLE.

Oracle Corporation markets its products worldwide through 30 direct sales offices, 11 distributors and the Authorized Oracle Dealer network. In addition, ORACLE is sold by numerous hardware manufacturers, including IBM, Honeywell, Sperry, Stratus and Prime.

ORACLE®

Compatibility • Portability • Connectability

For additional information, contact Larry Harman, Director, VAR Marketing, Oracle Corporation, 20 Davis Drive, Belmont, CA 94002 or call 800-345-DBMS

Restructuring roundtable

From page 27

to impose a new order on the way things might have looked in the past.

His product, Recoder, takes the most radical approach to restructuring, according to observers familiar with all three products.

Recoder is capable of breaking paragraphs in the program apart and reassembling them in a more logical order, sometimes creating paragraphs with new or replicated code to maintain a consistent logical path through the program.

W. Henry Morgan, vice-president of Group Operations, Inc., was a middle-aged gentleman with a practical, worldly air about him that could have been worn equally well on a favorite uncle or kindly Chicago ward heeler.

First to market

His company was the first to bring a restructuring product to market and Group Operations sits on a sizable lead over its competitors in terms of Superstructure's installed base.

Morgan frequently assured his listeners that a program looks more like the original after going through Superstructure than what emerges from competing products, a claim that might seem dubious to those who seek dramatic improvement.

Nevertheless, it addressed one of the hidden issues in restructuring, the threat to maintenance programmers that an old, familiar program will be run through a Cuisinart-type process and emerge as an unrecognizable puree.

Allow programmers to compare

Morgan urged that maintenance programmers be allowed to compare the output of all three products before a purchase decision is made.

The third protagonist was J. Cris Miller, a principal of Peat Marwick's Catalyst Group in Chicago and author of Structured Retrofit.

Miller was nattily attired in a three-piece suit, and his responses grew in forcefulness as he found his footing in front of the large audience.

He also appeared to be under the most pressure and most determined to uphold the company flag at all costs.

His product fell somewhere between Language Technology's and Group Operations', observers familiar with Retrofit said.

One user's analysis

One observer, who has evaluated all three products, was struck by the appearances of the speakers and offered the following analysis of how each company will fare.

"If the decision is going to be made by top management, then Bush, with his intellectual approach and his ability to supply numbers about the effects of restructuring, is going to win the deal.

If the decision is going to be made by maintenance programmers, they are going to be most comfortable with the Group Operations product. And if the decision is going to be made by a committee, then Peat Marwick has the best shot at it."

ADR updates 4GL offering

From page 27

Beta-test users said one convenience of Release 1.4 is its date-field processing capability. Ideal's internal functions can define date fields to be processed arithmetically rather than requiring a programmer to "go out and call in an assembler routine," said John J. Doherty, a programmer analyst at Wheels, Inc., a Des Plaines, Ill., fleet leasing firm.

"We like it. It's a feature they should have had a long time ago," said another beta-test spokesman, Ron Linehan, manager of systems development at the National Academy of Sciences in Washington, D.C.

Neither site had Release 1.4 applications in production use in order to sample whether they lived up to the claimed performance improvements. "It's very fast, from what I can see of how applications used to run under Release 1.3. But we haven't measured the speed," Doherty said.

Wheels is an ADR/Email user with terminals in its customers' offices. The new communications commands in Ideal will make it possible for customers to seek Ideal reports on the cost of different leasing packages, Doherty explained.

Farrelly said ADR's recent development efforts have concentrated on performance gains but that future development is likely to concentrate on added functionality.

Users unsure of windows standard

From page 27

Wadlow, a systems engineer at the computer-aided systems division at the Palo Alto, Calif., research facility of Schlumberger Ltd., said his department has been beta-testing Sun's NEWS product and that he believes it is more technically advanced than X Windows.

IBM announced late last year the incorporation of X Windows code in its Academic Information System 4.2, the Unix-based operating system for its RT Personal Computer, which is used in academic environments.

IBM's new 2,400 bps PC Modems give you an easy choice:

Either

Stand-alone. The IBM 5842 2,400 bps Modem.

Either way, you can't go wrong.

With IBM's new modems and a personal computer you can tap into information at a very impressive 2,400 bits per second (bps).

That translates into a binary file transfer speed of nearly 13 K characters per minute—or over six pages worth. Now imagine the impact that can have on your long distance telephone bill.

But these new modems aren't just fast, they're also versatile. They can both send and receive data asynchronously at speeds ranging from 2,400 bps down to 75 bps.

Both modems are compatible with the popular "AT" command set, as well as the IBM command set. And they have been tested for compatibility with leading PC communications software such as Crosstalk™ XVI, Microsoft® Access, Kermit, Smartcom® and Smartcom II®

Berkeley, AT&T Unix systems supported by Unisoft package

By Elisabeth Horwitt

BERKELEY, Calif. — Software announced last week by Unisoft Corp. enables a wide range of hardware systems to run AT&T's Unix System V.3 operating system, as well as applications written for University of California at Berkeley Unix Version 4.3, the company claimed. The emerging Unix industry standard, Posix, will also be supported by the product.

Use of Uniplus+ System V Release 3 cuts by 20% the time it takes to implement the latest AT&T and Berkeley versions of Unix on new types of hardware, according to Unisoft President and Chief Executive Officer Robert R. Ackerman Jr. The product also offers in-house developers a way to run both Berkeley 4.3 and Unix V.3 applications on the same system.

Uniplus+ V.3 will, in the future, incorporate both Posix and the X/Open Group's specifications for a standardized Unix-based application environment, according to Ackerman. Supported by a growing number of hardware and software vendors, Posix is "98% to 99% the same as Unix," with some Berkeley Unix elements added, according to Ackerman. The Institute of Electrical and Electronics Engineers, Inc. and Unix users group /Usr/Group hope to resolve the differences between Unix V.3 and Posix and to produce a fully functional standard by year's end.

Uniplus+ Version V Release 3 incorporates Unix V.3 and Berkeley 4.3 features such as shared libraries and mandatory and advisory file and record locking.

Networking features include Transport Level Interface and Transport Provider Interface as well as Streams, which encompasses a set of tools for developing communications services within the operating system kernel. The product also includes a new release of Unisoft's B-Net, a networking system based on Transmission Control Protocol/Internet Protocol, as well as an implementation of Sun Microsystems, Inc.'s Network File System (NFS). NFS provides remote file access between different Unix systems.

Also available with the product is Unisoft's PC Interface, which enables an IBM Personal Computer to communicate with systems based on Uniplus+.

Standard Uniplus+ V.3 features include the Korn shell, one of the two major shells used with Unix V.3; full windowing capabilities; a smartboard executive; slave application processor support; power-fail recovery; and international language support. Performance is also improved through a large block-file system, which increases fourfold the number of bytes that can be read at one time.

Uniplus+ V.3 will be available in the first half of this year.

or

Internal.
The IBM Personal Computer 2,400 bps Modem.

The Automatic Modems

These modems feature Automatic Adaptive Equalization at 2,400 and 1,200 bps—which means they will continuously fine-tune themselves to compensate for changes and noises on the telephone line. The result is, you can receive data over a wider range of telephone line conditions.

Both modems also feature automatic or manual answering and dialing. They'll automatically switch to pulse dialing if tone dialing doesn't work. They have automatic redialing. And once a connection is made, automatic speed detection. They also have automatic detection of a voice or a failed call.

A Modem with a Memory of Its Own

The stand-alone IBM 5842 2,400 bps Modem offers some additional features. It can also send and receive data synchronously at speeds of 2,400 bps or 1,200 bps. You'll find extensive "Help" menus. A dial directory for 20 phone numbers. A log-on directory for five log-on sequences. A built-in pattern generator for self testing. Diagnostics implemented from the front panel as well as from the computer keyboard. And a complete array of LED Status Indicators to give you a quick visual check on what's happening.

Which One Is for You?

The internal IBM Personal Computer 2,400 bps Modem is designed to occupy a half slot in the IBM PC, XT, AT and 3270 PC.

The stand-alone IBM 5842 2,400 bps Modem is compatible with all models of IBM Personal Computers. And, in addition to the features mentioned above and its internal power supply, the significant difference is that a stand-alone modem can be moved from PC to PC more easily than an internal modem.

If you feel that 2,400 bps is more modem than you need, we also offer the stand-alone IBM 5841 1,200 bps Modem, and the internal IBM Personal Computer 1,200 bps Modem.

For the Authorized IBM PC Dealer nearest you—or for free literature on the IBM family of PC Modems—call 1 800 IBM-2468, Ext. 90/EM. Or you can contact your IBM marketing representative.

IBM

Crosstalk is a trademark of Microsoft, Inc. Microsoft is a registered trademark of Microsoft Corp. Smartcom and Smartcom II are registered trademarks of Hayes Microcomputer Products, Inc.

DEC broadens Baseway sales

MAYNARD, Mass. — Digital Equipment Corp. recently announced that Baseway, its software development package for factory automation applications, is available to OEMs.

At the same time, Scientific Systems Services, Inc. in Melbourne, Fla., said it will sell Baseway and plans to market it to discrete manufacturers such as those in the automotive, appliance and aerospace industries.

Originally designed for the automotive industry, Baseway has been available to end users since 1984. The system runs under VMS.

DEC said it will sell the software separately, with prices starting at $13,000 for a Microvax II version, or as a complete package. The $100,000 package includes Baseway, a Microvax II, a PDP-11 model to act as the controller for factory floor devices and licenses for VMS and Decnet.

— Rosemary Hamilton

COMPUTER ASSETS TRACKING SYSTEM

The first PC-based data center management tool to help you better manage:

- EQUIPMENT ON ORDER
- INSTALLED INVENTORY
- PROBLEM REPORTS
- CHANGE REQUESTS

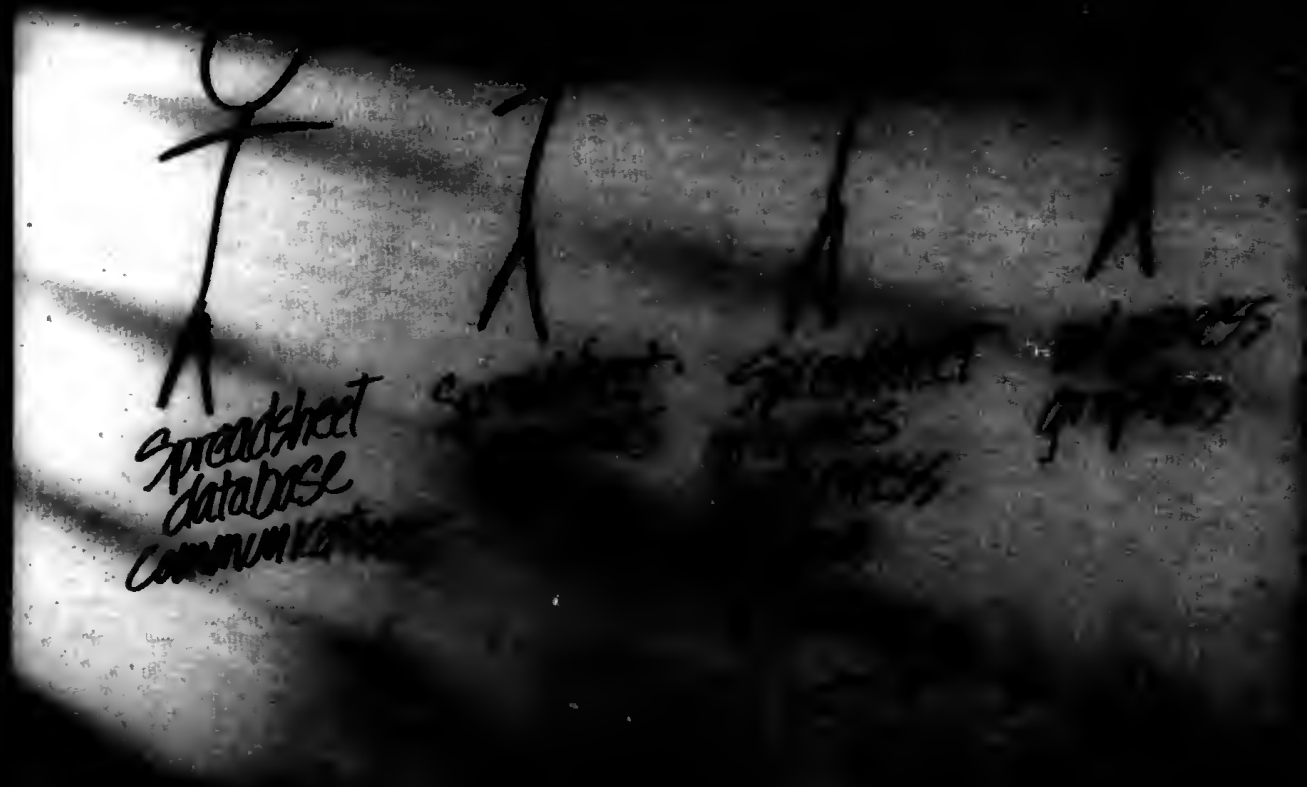
FREE SITE LICENSE WITH THIS AD

To order CATS or a free demo diskette, call 214/823-2784 or write:

[redacted]

Management Systems Inc

DEALER INQUIRIES WELCOME


spreadsheet
database

Symphony® is the one software product no business and no business person can afford to be without.

Based on the 1-2-3® spreadsheet technology, Symphony pulls together five key functions in one program. Functions that help a marketing manager work smarter. Give a financial analyst a clearer picture. Run an entire company more effectively.

An all-in-one investment, Symphony increases in value over time. It offers continuous growth through Lotus® Add-in products like Spelling Checker, Text Outliner, Symphony Link™ and through more than 250 specialized applications designed by independent software developers.

What's more, Lotus backs Symphony with a free telephone hotline and Lotus PROMPT,™ a new comprehensive user support program.

One product to train on. One company to support you. One investment that grows over time. For all these reasons, you should consider standardizing on Symphony to meet the personal computing needs of your corporation.

Lotus Symphony

A complete general-purpose software tool built around the world's leading spreadsheet technology.

© 1986 Lotus Development Corporation. Lotus 1-2-3 and Symphony are registered trademarks of Lotus Development Corporation
Symphony Link and Lotus PROMPT are trademarks of Lotus Development Corporation

Turn batch COBOL programmers into on-line programmers in 1 day.

With COBOL/XE *all* your batch COBOL programmers can now develop CICS, CMS, and TSO applications...without tedious on-line coding and without learning complicated, new coding techniques. Put their skills to work now to help you cut your backlog of on-line applications...and do it faster and more efficiently than ever before.

Familiar, Natural Coding. COBOL/XE reduces training costs by extending the familiar set of batch COBOL commands to the on-line environment. Now, programmers can develop on-line programs simply and naturally, using easily learned extensions of ANSI COBOL.

Eliminate BMS Mapping. Using COBOL/XE's interactive screen PAINTing facility, anyone can quickly and easily design screen layouts on a 3270 or PC/370 screen without writing a single line of code. New screens can handle any attribute an application may require, completely eliminating the need for complex BMS code.

Portability of Code. On-line applications can be developed and tested with COBOL/XE in any environment and executed in any one of them without being changed or recompiled. Develop applications in one environment and execute them in another with no extra coding.

Reduce Debugging and Maintenance. The COBOL/XE debugger provides real-time tracing, testing, and verifying of a COBOL/XE program's logic, saving the time and expense of trial-and-error testing. By specifying various break conditions, you can dynamically control the execution of any COBOL/XE program.

Without COBOL/XE. *A pseudo-conversational task coded in Command-Level COBOL.*

With COBOL/XE. *A pseudo-conversational task coded in COBOL/XE. COBOL/XE automatically performs the functions necessary for pseudo-conversational CICS execution simply by using the verbs DISPLAY and ACCEPT. Complex CICS code is unnecessary, and efficient execution is ensured.*

Solid Support. Seventeen years in the software business gives our worldwide staff the expertise you need to optimize the effectiveness of your corporate computing resources. From installation, consulting and training to pre- and post-sales support, we're there to offer you our knowledge.

Free Trial. Turn batch COBOL programmers into on-line programmers in *one day* with COBOL/XE. Call or write to arrange for a free 30-day trial. On-Line Software International, Inc., Two Executive Drive, Fort Lee, NJ 07024. In Canada, call 201-592-0009.

800-642-0177

On-Line Software International
Authorities in IBM® Software

COBOL/XE. *The On-line Applications Development System for the Batch Programmer.*

IBM is a registered trademark of International Business Machines

SYSTEMS & PERIPHERALS

HARD TALK
Stanley Gibson

Solving the DASD mystery

In this Sherlock Holmes centennial year, it is fitting that a long-standing mystery be solved. Indeed, the denouement of a plot that might be called "The Case of the Dastardly DASD" is at hand.

In September, IBM began a program of replacing parts on all outstanding Models A04, B04 and AA4 of its standard 3380 direct-access storage devices (DASD), signaling the beginning of the end of a 4-year-old problem.

Difficulties with the head disk assembly that led to head crashes originally cropped up in 1983. At first, the cause was thought to be certain fungicides in computer room air-conditioning coolants that deposited tin oxide on the disk heads. Later, it was determined that the fungicides would merely speed up the development of the real problem, which was that flame-retardant chemicals, antimony and bromine, came loose from the plastic air system parts to which they were bonded.

According to Reliability Research, Inc., a consulting firm in Norwalk, Conn., the first instance of a customer being told that antimony and bromine were at fault occurred in June 1985. Even before that, however, a manufacturing change was made, altering the design of plastic air-intake parts. But not until last September, according to the firm, was an engineering change on existing head disk assemblies made,

See SOLVING page 35

Gibson is a Computerworld senior writer.

Intel offers network server

Targeted at financial, federal organizations

By James Connolly

HILLSBORO, Ore. — Building on the base technology of its 2-year-old System 300 series of supermicrocomputers, Intel Corp. last week announced a departmental network server targeted at functional departments in large organizations.

The Opennet Multiserver reportedly integrates equipment and functions previously available separately and features enhancements for some of those features. In addition to announcing the server, Intel officials said they plan to make processor upgrades available for the server and the 300 series in April.

The board-swap packages will allow users to install Intel 80386 processors in place of the Intel 80286. No prices for the package are available yet.

Claude Wimberly, marketing manager for Intel's systems operation, reported that Multiserver is targeted at large government and financial organizations. He claimed Multiserver is particularly well-suited to environments in which several personal computer Ethernet networks need to be linked to each other or to a minicomputer or mainframe host system.

Single, central link

Key features include menu-driven administration, transparent network file access, virtual-terminal capabilities for personal computers to run applications on the server and the ability to serve as a single, central link between personal computers and larger systems.

"Personal computers can now share department resources such as expensive laser printers, as well as communicate with corporate-level mainframes. The system allows users to work on files without bogging them down with having to know where the files are located in the network," Wimberly said.

The server runs Intel's version of Microsoft Corp. Xenix. It supports 140M bytes of disk storage, a 60M-byte tape backup and a 320K-byte floppy disk drive and uses an 8-MHz 80286 CPU. Prices range from $15,000 to $30,000.

Storage Technology subsystem offers Unisys 1100 compatibility

By James Connolly

LOUISVILLE, Colo. — Storage Technology Corp. (STC) last week introduced a tape subsystem designed for use with Unisys Corp. 1100 mainframes or in mixed environments with Unisys, IBM and Control Data Corp. systems.

The 4700 Tape Subsystem is based on STC's existing Storagetek 4600 tape subsystem but features a greater range of compatibility with the 1100 family of mainframes produced by the former Sperry Corp. arm of Unisys.

"One of the outstanding features of the 4700 is its versatility. It can be attached simultaneously to multiple Sperry and IBM mainframes for shared access and storage capability. This tape-pooling ability is unique to the industry," said Carl Raine, STC vice-president of worldwide marketing.

Raine also said cooling, power and space requirements are reduced by 40% in comparison with Unisys products. He said the 4700 does not require raised flooring or stand-alone control units.

The controlling drive, the 4700A70, costs $47,500, and the 4700B70 costs $21,000. Both drives operate at 200 in./sec.

INSIDE

Ibis Systems unveils a disk subsystem using Intelligent Standard Interface/34

Memorex adds to 3270 peripheral offerings/34

NEW THIS WEEK

- Informer Computer Terminals offers portable workstation
- For more on this and other new products, see pp. 59-62.

INSTANT ANALYSIS

"They dug themselves a grave, but it is too soon to bury them. They are starting to claw their way out."

— John McCarthy, Forrester Research, Inc. analyst, on Wang Laboratories, Inc.

Multiple Domain Facility saves users time, cost, space

By Jeffry Beeler

In little more than two years, Amdahl Corp.'s Multiple Domain Feature (MDF) has worked its way into 30% of Amdahl's 580 series mainframe sites and, users say, has helped to save on software costs, unneeded equipment, systems programmer time and floor space.

Customers also cite the product's ability to allow them to run production and development tasks concurrently on one system — a practice most users normally shun.

In addition, the feature's overhead typically consumes only 2% to 3% of a system's resources, compared with at least 10% for its nearest equivalent, IBM's VM host operating system, according to customers.

Introduced in November 1984, MDF divides a mainframe into two or more discrete domains within which similar or dissimilar operating environments can run concurrently and independently. The product does in hardware for Amdahl what VM does in software for IBM.

How a processor's resources are distributed among constituent logical machines is left to the user. Moreover, customers can later shift resources from one domain to another to reflect changes in applications.

Although the product was designed to suit an assortment of uses, it has gravitated to some uses more strongly than others. In one of its more popular applications, customers reserve part of their system for IBM MVS production jobs and use the rest to convert existing programs to IBM Extended Architecture (XA).

A typical case involves National Computer Services, Inc. (NCS), a Chicago-based commercial time-sharing provider that uses MDF to create two domains in its Amdahl 5860 uniprocessor. The company supplies its clients with remote job entry, a time-sharing option and CICS services on one domain. From the other, it moves applications and customers to MVS/XA, a process that is roughly 50% to 60% complete.

The time-sharing service considered other XA conversion aids. One alternative would have been to acquire a second 5860. "But obviously, that option would have been much more expensive than using MDF," observes Paul Sarris, NCS's chief executive officer.

Also setting aside part of its MDF-equipped mainframe for a migration effort was Republic Bank Corp., a Dallas-based bank-holding company. Republic found the feature helpful during its 19-month conversion, which ended in October, says Republic Bank's senior vice-president, John Gala. "MDF greatly facilitated our conversion by allowing us to do our XA and production work in parallel during prime shifts," Gala says.

Another common MDF application is distinguished by the presence of a different IBM operating system in each logical machine. For example, Federal Express Corp.'s Colorado Springs development center houses a dual-processor Amdahl 5880 running MVS and IBM VM/CMS.

NCS and Republic Bank restrict their mainframe operating environments to MVS and MVS/XA, but Federal Express parcels its resources between MVS and VM/CMS. The 5880 supports three domains — for MVS application testing, quality assurance and system software testing — plus a fourth for VM development, according to Denis Mattingly, Federal Express's senior manager for technical services.

In a third MDF application, users maintain a uniform operating environment across all their domains but run a radically different software

See FACILITY page 34

Ibis disk subsystem compatible with CDC Intelligent Standard Interface

WESTLAKE VILLAGE, Calif. — Ibis Systems, Inc. has announced a high-speed disk drive subsystem using an interface designed to be compatible with Control Data Corp.'s Intelligent Standard Interface.

The Ibis-II, based on the Ibis Model 1400 disk drive, reportedly features a capacity of 1.4G bytes and a peak data transfer rate of 12M byte/sec. The interface added to the Model 1400 was developed under a 1985 contract with CDC spin-off ETA Systems, Inc. ETA Systems and Ibis worked together in defining the requirements for the Ibis-II interface, which CDC specified in 1982.

The subsystem was designed for use with ETA Systems' ETA-10 supercomputer and Star Technologies, Inc. array processors. Star has accepted delivery of the Ibis-II, and ETA Systems installed the subsystem on the first field-test version of the ETA-10 at Florida State University this month.

The 12M byte/sec. transfer rate is intended to meet the need to transfer large blocks of data in scientific applications. The drive can be formatted in 4K- or 16K-byte sectors.

The Ibis-II with Intelligent Standard Interface-compatible interface costs $70,000.

Memorex adds modular unit

Rollout allows users to customize terminal

SANTA CLARA, Calif. — Memorex Corp. recently announced the 2180 modular terminal, a monochrome version of its 2180C color terminal announced last fall. Both are plug-compatible replacements for the IBM 3180 display terminal.

The terminals have a modular design that lets users customize their terminals by interchanging logic modules and keyboards. They are designed for high-volume data entry and interactive processing, according to Memorex.

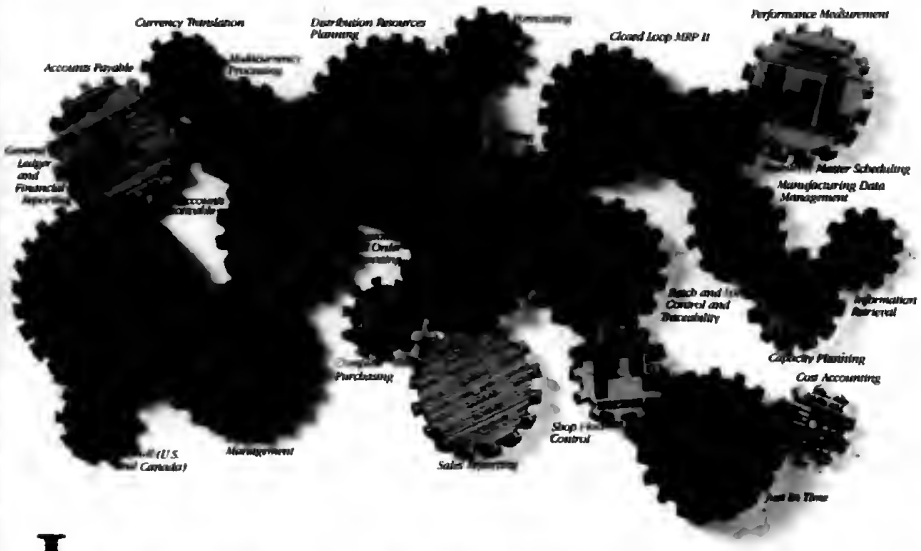
The 2180 has a tilt-and-swivel monitor to adjust the viewing angle, an extra port to attach I/O accessories and light-pen support.

Users have a choice of six keyboards: three 122-key keyboard styles and three 88-keyboard styles, according to the vendor.

The terminals are available at a single-unit price of $1,995.

In addition, Memorex announced the 2173-B screen printer, which replaces the current 2173 model, offering more features at a lower price.

The screen printer features serial and parallel interfaces and full-size or half-sheet printing. The 2173-B is listed at $425 with a serial interface and $400 with a parallel interface.



If your System 38/36 software can't integrate this many business functions, shift to BPCS.®

Read why BPCS is outselling all other integrated 38/36 software — even IBM's MAPICS:

If distributors had only to worry about inventory control, or manufacturers about manufacturing, the business world would be a simpler place. But today more than ever, businesses are complex networks of interlocking functions.

That's why every six business hours, another company chooses BPCS: integrated software for the IBM® System 38® and System 36® that lets you manage different parts of your business the same way. It's the choice of more companies than any other integrated 38/36 business software.

Modular for easy expansion.

Each of our 23 integrated modules puts another aspect of your business operation under your control. You may choose to use a single BPCS module. Or start with the one you need most and add more as your needs dictate. Either way, the BPCS modular design allows easy expansion.

The worldwide SSA Affiliate network — our secret to service and support.

Our Affiliate network is a handpicked, worldwide team of application experts who intimately know our software and your business requirements. *Only* SSA can provide local support worldwide.

We'll back the installation of BPCS, and help you tailor it to your unique business requirements.

And if you have any questions about the operation, modification or expansion of BPCS, an Affiliate will always be there with solutions.

We're the System 38/36 application software experts.

SSA is a *software* company. And we only make software for the System 38/36. That means everything in our organization is geared toward one goal — to help 38/36 users get their companies running like clockwork.

Call us today and we'll send you more information on what BPCS can do for your company.

CALL 1-800-MFG-3638

SSA, 200 West Madison Street
Chicago, Illinois 60606
(312) 641-2900, Telex: 280379 SSA CGO

SSA

IBM, MAPICS, System 36, System 38 are registered trademarks of International Business Machines Corporation.

SSA and BPCS are registered trademarks of System Software Associates, Inc.

Facility saves users time, money

From page 33

subsystem within each. Memorex Corp. in Santa Clara, Calif., executes manufacturing process control systems under CICS on one side of its 5860 and standard accounting functions under TSO on the other.

"We assigned each application its own domain because CICS and TSO usually don't share environments particularly well," according to Steve Terry, Memorex's manager of corporate systems services.

Like many other users, Memorex and Federal Express used MDF to consolidate separate mainframes into one. Before installing MDF almost a year ago, Federal Express's Colorado installation operated four IBM 3033s, one for each of its four MVS and VM programming systems. The company has since transferred all activity to the 5880, Mattingly says. The consolidation translates into a 50% increase in the amount of usable data center floor space.

The advantages of consolidation are not limited to floor space economies, however. By cutting the number of CPUs, users can eliminate redundant operating system and program licenses and avoid attendant overhead.

During its pre-MDF days, Memorex ran manufacturing jobs on an Amdahl 470V/6 and commercial applications on a 470V/8. By moving both systems to its 5860, the storage products vendor has been able to cancel one set of licenses and use the other to control both domains.

"The cancellation has cut our software costs well in excess of $50,000 to $60,000 per year," Terry notes. Because it now operates one CPU instead of two, Memorex has also seen a decline in its systems-related utility bills.

Not all of MDF's benefits, however, are readily quantifiable. At NCS, for instance, the product has simplified life for systems programmers and, in doing so, has raised its level of customer service, Sarris says.

Until recently, systems programmers often worked nights to minimize contention for resources during the day. MDF allows development and time-sharing activities to coexist on one machine but shields the latter from development problems.

Solving the DASD case

From page 33

leading to the wholesale preventive maintenance that is still in progress.

From the first occurrence of the problem, it took IBM two years to discover the cause of the problem and perhaps another two years to institute preventive maintenance, which was begun well after the drive ceased production.

Now, IBM has a new generation of drives, Models D and E, and Big Blue is interested in selling these to its users. To stimulate sales, IBM is offering to replace the front HDAs (the ones susceptible to crashes) on all drives for users who have had a history of crashes. For others, IBM is performing the parts replacement so that customers may resell their units with a clear conscience.

For some users, it is a good deal to sell an old rebuilt drive and put the money toward a more powerful new one, particularly if they are taking their systems down and backing up data, to make way for the parts change or HDA replacement. If IBM had replaced HDAs earlier in their life cycle, it would merely have been an expense for the vendor. Now, it can be viewed as a stimulant to sales.

Big Blue's bottom line

IBM has spread the problem out over several fiscal years, so that Big Blue's bottom line has been insulated from an immediate adverse impact. In the process, users, as a group, were never told the nature of the problem until IBM had a new drive to sell them, nor were they protected by adequate preventive maintenance from head crashes, which broke out in some users' shops like small epidemics.

According to Reliability Research, a key role in resolving the problem was played by a users' bulletin board. Users exchanging notes on HDA problems were armed with plenty of information when IBM reps came calling to expound the company line on the problem.

With hundreds of messages being exchanged on this topic on the bulletin board, IBM was not amused, according to Tom Gallaudet of Reliability Research. IBM was being sent a disk of the forum's dialogues, but when the 3380 came under heated discussion, IBM asked not to be sent any more forum records, Gallaudet recounts.

Clearly, IBM is happiest dealing with each customer in isolation, on a one-to-one basis. But imagine how absurd it would seem if General Motors Corp., for example, were to become annoyed every time two Chevy owners talked with one another about their cars.

If users cannot call on Mr. Holmes of Baker Street for assistance, at least they can combine their own powers of deduction with many other managers through means such as bulletin boards and users group meetings. Few doubt that IBM is looking out for its interests. Users' interests are no less important.

• ADVERTISEMENT • ADVERTISEMENT •

Directories List 46,000 DP Users

Each directory of computer installations lists 10,000-16,000 computer users covering the NY Metro Area (NY, NJ & CT), the Mid-Atlantic States (PA, VA, MD, DC, WV & DE), and the New England area (MA, ME, NH, RI & VT). Each site includes a profile of the hardware installed, software installed, (languages, databases, etc.), consultants used, future plans, applications and DP executives' names, titles, and phone numbers. An index provides quick access to 133 cross references by hardware, software and industry. Price: NY-$700, MA-$395, and NE-$395. Call (212) 683-0606. Computer Management Research, Inc. 20 Waterside Plaza, NY, NY 10010.

AT&T IS IN SMARTER PROPOSALS.

WITH THE AT&T ACCUNET® FAMILY OF DIGITAL SERVICES AND THE AT&T CONSULTANT LIAISON PROGRAM.

For high-quality, end-to-end digital communications, the smarter proposal is AT&T's ACCUNET Family of Digital Services.

Our extensive line of digital services, including DATAPHONE® Digital Service, ACCUNET® T1.5 Service, ACCUNET® Reserved 1.5 Service, ACCUNET® Packet Service and ACCUNET® Switched 56 Service, can answer virtually all of your customer's information transfer needs.

From Electronic Order Exchange and Video Teleconferencing, to CAD/CAM and Bulk Data Transfer.

All with excellent digital reliability and accuracy.

But just as importantly, through the AT&T Consultant Liaison Program, we can work with you to integrate these services into your proposals, so that your recommendations will maximize your client's movement and management of information on a global scale.

In addition, our CLP Network Communications Applications and Services manual (available for a small fee) provides you with a comprehensive fingertip reference for all of AT&T's wide array of network services.

In short, the people and services of AT&T can help you make more informed, strategic recommendations to solve your customer's complex business needs.

And that's a smarter proposal for you, as well as your customers.

The AT&T ACCUNET Family of Digital Services and the AT&T Consultant Liaison Program. More good reasons to partner with AT&T.

To find out more, talk with your account executive at AT&T. Or call 1 800 CLP-INFO.

© 1986 AT&T

AT&T
The right choice.

Watch what happens next time you ask a mainframe software vendor for a complete customer list.

You may get a convincing song and dance, but underneath it's a different story. Behind those pat answers that software vendor is actually sweating and squirming.

Why don't they want you to see a complete list? Simple. They know that their size and name familiarity do not guarantee happiness. Many "single source" or "all-things-to-all-people" vendors have, at best, uneven quality across a multi-application product line. They know that their customer list may contain a good number of less-than-happy clients. It's difficult for these vendors to commit the human and monetary resources necessary to produce the type of superior product available from a firm that specializes in a single application area. A firm like Data Design.

Data Design develops mainframe financial applications software. Period. We understand all our users' requirements and are therefore able to provide the necessary support: over 40 percent of our support and installation staff are CPA's or have MBA's.

Data Design doesn't balk at giving prospective customers a *complete* customer list. That's because hundreds of FORTUNE 1000 companies have reaped exceptional results from our financial software systems. Alcoa, Gerber, Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank, The New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds more have opted for Data Design over other major vendors. Write for our complete customer list and ask *anyone* on it about our fast, trouble-free implementation; system flexibility and ease of use; in-depth training and responsive, knowledgeable support; *management level* people in customer service positions, and more.

You'll find that people who want financial software relief choose Data Design. Since 1973, nationally recognized independent software surveys have confirmed Data Design's unsurpassed record of user satisfaction—year after year. That's why we'll give you a complete customer list—and *they* won't.

So, if you're in the process of looking at mainframe financial software for your company, put Data Design on your list. Then tell the other vendors on it you're also looking at Data Design. And watch what happens.

Financial software by Data Design.
Simply the best.

GENERAL LEDGER
ACCOUNTS PAYABLE
PURCHASE ORDER CONTROL
FIXED ASSETS
PROJECT ACCOUNTING SYSTEM

Learn more about the best financial software available, call Betty Fulton toll-free at 800-556-5511 today.

DATA DESIGN ASSOCIATES

Excellence in financial software. By design.

1279 Oakmead Parkway, Sunnyvale, CA 94086

MICROCOMPUTING

MICRO BITS
William Zachmann

Cruise control for cursors

To be honest, slow cursor movement and cursor run-on weren't problems I thought I had. So when I received a copy of Revolution Software, Inc.'s Cruise Control, it sat in software limbo, unopened, for weeks.

This ignorant and uninformed attitude lasted until I finally broke the shrink-wrap and tried Cruise Control. It is another of those ingenious utilities for IBM Personal Computers and compatible systems that, once you use it, makes you wonder how you ever got along without it.

The primary functions of Cruise Control are straightforward in both concept and execution. In the first place, it greatly accelerates cursor movement when you are using the cursor-control key on the keyboard.

A lot of applications software simply processes repeating cursor-control keys at the standard autorepeat rate of the keyboard. This can be interminably slow if you want to move the cursor a long distance, such as across many rows or columns of a spreadsheet or in a word processing document.

Cruise Control traps cursor-key presses and feeds them to the application at a rate up to the maximum speed that the application can process them. For all but a few older programs, this means cursor movement rates can be greatly accelerated.

In addition, Cruise Control lets you adjust the cursor rate to your own preference. It uses a special key in combination with others (the "5" key on the

See CRUISE page 39

Zachmann is vice-president of research at International Data Corp.

Support program debated

Users dispute cost, value of Ashton-Tate offering

By Doug Barney and Peggy Watt

TORRANCE, Calif. — Users continue to have mixed reactions to Ashton-Tate's corporate pay-for-support program, with some refusing to participate citing high prices and others saying they believe support is worth the price.

Despite the user criticism, Ashton-Tate claimed the program announced in August has exceeded expectations. "We are not into the hundreds yet, but we are moving toward the first hundred," said Karen Orton, director of services and support for Ashton-Tate. "We are not selling millions of dollars worth of this stuff, but we never intended to."

Corporate users had until the end of last year to decide whether to pay $4,000 for the corporate support plan before free corporate support runs out. For individual end users, free support expired on Dec. 1.

Many users remain uncomfortable with the new concept of paying for support. "We will never pick it up. The frustration for most users of waiting on the phone puts a bad taste in your mouth," said Bob Merkel, project engineer at Professional Control Corp. in Germantown, Wis. "When they come out with a pay plan, it is kind of a slap in the face."

Like many users, Professional Control will provide its own support. "You just have to spend more time discovering and working out the bugs yourself," Merkel said.

"We did not sign up for the Ashton-Tate program; we can't justify $4,000 and we have good internal support. That [policy] needs to be put into some licensing program," said Alan Gross, president of the Microcomputer Managers Association International, New York, and a micro manager for a firm he asked not to be identified.

Another user argued that the program has to become more flexible and less costly. "I told Ashton-Tate that I am not interested. Until it is more flexible and I can pick what I want at a reasonable cost, I won't pursue it," said a computer support manager with a large banking firm.

But other users, mainly with large corporations, argue that support is worth the price. "The contract is signed," reported Judy Galgano, manager of office automation for Grumman Corp. in Bethpage, N.Y. "We have felt in the past that we have gotten a pretty good level of support, and we

See CUSTOMER page 39

Adjunct products beef up Dbase

By Peggy Watt

Users of Ashton-Tate's Dbase products are enhancing the powerful microcomputer data base development system by drawing from a growing selection of adjunct products.

"When Dbase doesn't do the job, we look around for something else," says Thomas G. Pantazi, systems analyst for end-user computing at Grumman Data Systems, a division of Grumman Corp. in Bethpage, N.Y. He says he prefers compatible — not replacement — products.

Like many managers, Pantazi says he has too much invested in Grumman's more than 700 microcomputers running Dbase to switch data base management systems entirely. He uses outside compilers to speed up Dbase execution and editing tools from Wallsoft Systems, Inc. to splice programming changes.

Grumman recently standardized on Alpha 3 from Alpha Software Corp. in Burlington, Mass., as a front end for Dbase data bases. "It helps the end user who doesn't know much about Dbase to handle the system," Pantazi says about the menu-driven Dbase-compatible package. "As the users grow, functionality can grow, but they can retain the architecture."

Just as the Lotus Development Corp. 1-2-3 aftermarket has spawned a selection of helper programs, Dbase supplements keep

See ADJUNCT page 38

NEW THIS WEEK

- CMS offers a 60M-byte hard-drive subsystem for IBM PCs

For more on this and other new products, see pp. 59-62.

INSTANT ANALYSIS

"We're trying to create mass software — for the Macintosh — for the rest of us. The programs for $400 are for the rich of us."

— Philippe Kahn, president of Borland International, on the Borland philosophy

ORACLE'S EASY*SQL: THE 1ST NOVICE-USER INTERFACE TO THE 1ST SQL-BASED RDBMS

Oracle Corporation's new end-user interface, Easy*SQL, makes the ORACLE relational database management system (DBMS) instantly accessible to novice and casual users.

Oracle pioneered the SQL language with its 1979 release of the ORACLE relational DBMS. With its Easy*SQL product, Oracle becomes the first company to make a true SQL-compatible database available to users at all levels of computer literacy within an organization.

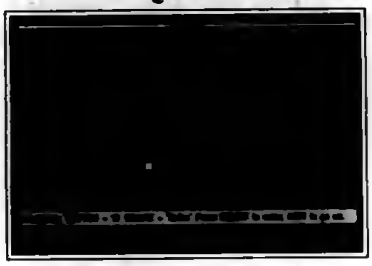
ORACLE's database facilities are available through three distinct user interfaces: Programmer interfaces; command and forma-oriented interfaces for trained end-users; and now Easy*SQL, for the large number of and users who are unfamiliar with SQL but need the benefits of a relational DBMS."

EASY*SQL: SIMPLE INTERFACES, YET FULL SQL FUNCTIONALITY

Easy*SQL's state-of-the-art visual interface includes point-and-select menus; pop-up windows (mouse support on the PC); automatic hints and context-sensitive help; ad hoc relational query capabilities; report writing, table creation and maintenance, user-selectable color graphics; bar, pie and line charts; data entry and updates using fill-in-the-blanks techniques. It even includes the Query Preview Facility.

QUERY PREVIEW FACILITY

Easy*SQL's Preview facility is one of the notable query features tailored for the novice user. During the creation of a database query, the user can press a Preview key, causing the opening of a window in which up to 5 records satisfying the query are displayed.



The rapid execution of the Preview facility lets a user make certain that the query s/he is interactively "building" is, in fact, a correct expression of the user's desire.

MASTER SQL IN 5 MINUTES

PORTABILITY

Like all Oracle Corporation products, Easy*SQL runs identically on mainframes, minicomputers and PCs.

CONNECTABILITY AND COMPATIBILITY

Easy*SQL includes the Easy*Link intelligent micro-mainframe link announced last June. Easy*SQL menus let users access other Oracle programs, including the company's SQL*Calc Lotus-compatible spreadsheet. Finally, while normal output of user queries is directed to the user screen, the user may redirect the output to standard PC data files, including DIF, PRN, SYLK and WKS formats.

To find out how everyone in your organization can access your database call 1-800-345-DBMS today. Or write Oracle Corporation, 20 Davis Dr., Belmont, CA 94002.

ORACLE®
Compatibility • Portability • Connectability
Copyright © 1986 by Oracle Corporation. TM/RA

Adjunct products beef up Dbase

From page 37

popping up. But while the Lotus add-ons are often utilities to make spreadsheet-work easier, several Dbase users say they turned to third-party products because of deficiencies in Dbase.

Foremost among these is the lack of a compiler. Ann F. Bruner, a systems analyst with the Massachusetts trial courts system, says she has turned to such third-party compilers as Clipper from Nantucket, Inc. in Culver City, Calif.

However, with networking plans in the works, Bruner says she hesitates to stray far from the original product in order to avoid compatibility problems later on.

Not all users are concerned with maintaining compatibility. Companies that compile all their data bases with Clipper no longer need Dbase; therefore, continued compatibility does not matter, says Alan Gross, president of the Microcomputer Managers Association International. However, even managers who say they use Clipper keep their copies of Dbase current.

Shortfall

Ashton-Tate President Edward M. Esber Jr. acknowledges Dbase's shortfall. "Compilers are a legitimate need for the customer," he says. "The compiler market is rapidly approaching the level that Ashton-Tate should take a look at it."

But Esber says he does not intend to squash the growing aftermarket. "We want to nurture those people. They survive off the niches of Dbase," he adds. "But as the market grows, we may want to co-opt some of it."

Dbase's ubiquity is also some managers' reason for eyeing third-party products. "Anybody can get a book on Dbase and learn to make modifications in a data base," and curious users sometimes do, according to Kingsley Mar, manager of research and development for the Systems Resource Management Group of Wells Fargo Bank, National Association in San Francisco. "We use Clipper to lock the code. It's like child-proof caps," Mar says.

Want speed increased

Other users say they want the increased speed of a data base compiled with alternative Dbase compilers. They mention Foxbase from Fox Software, Inc. in Perrysburg, Ohio, and Quicksilver by Wordtech Systems, Inc. in Orinda, Calif.

"I have to do a lot of work with our existing code to compile it," says Jim Thompson, a systems analyst with Thompson Consulting Group in Santa Monica, Calif. "Foxbase could make that painless, and the programs will still run with Dbase."

Many third-party products "are better than Dbase but have the users understandably concerned about future compatibility," says Adam Green, a data base expert and industry observer who has written several books on Ashton-Tate products.

Green claims that users will pay more for that promise, whether from Ashton-Tate itself or an add-on vendor.

"People would prefer their compiler from Ashton-Tate," agrees R. F. Gully, a consultant with The Quilcene Corp. in Walnut Creek, Calif. "They want the support and consistency and have some product loyalty."

Dbase upgrades

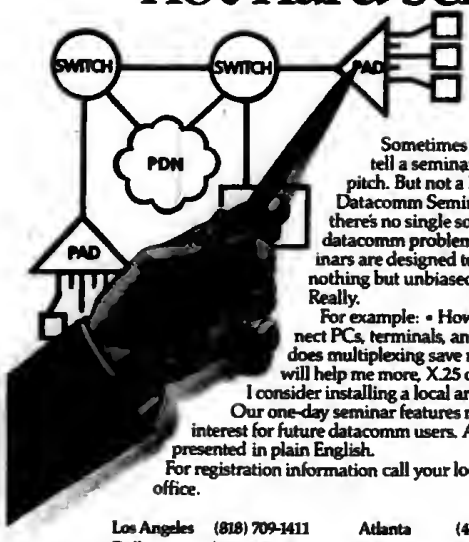
Dbase upgrades have included some of those features previously offered only by outsiders, such as a program generator in the recent version.

However, for complicated applications, some users still turn to outside, full-featured application generators such as Genifer from Bytel Corp. in Berkeley, Calif.

Ashton-Tate even invited some of its apparent rivals to its recent developers' conference in Los Angeles. "They actually help promote the Dbase standard," says Roy E. Folk, Ashtoo-Tate executive vice-president.

MICOM® data communications seminars

Hard answers, not hard sell.



Sometimes it's hard to tell a seminar from a sales pitch. But not a MICOM® Datacomm Seminar. We know there's no single solution for all datacomm problems. So our seminars are designed to give you nothing but unbiased solutions. Really.

For example: • How can I connect PCs, terminals, and minis? • How does multiplexing save money? • What will help me more, X.25 or T1? • Should I consider installing a local area network?

Our one-day seminar features many topics of interest for future datacomm users. And all are presented in plain English.

For registration information call your local MICOM® office.

Los Angeles	(818) 709-1411	Atlanta	(404) 435-2999
Dallas	(214) 258-0774	Boston	(617) 527-4010
Chicago	(312) 964-0551	New York	(201) 836-4000

Anaheim, CA
March 11
Atlanta, GA
January 22
Austin, TX
February 17
Boston, MA
May 20
Burbank, CA
April 22
Chicago, IL
January 13
March 10
Cleveland, OH
February 11
Dallas, TX
February 12
Dayton, OH
January 20
Detroit, MI
February 10
Fort Wayne, IN
March 4

Honolulu, HA
March 5
Houston, TX
February 10
Indianapolis, IN
January 14
Kansas City, MO
January 14
Long Beach, CA
January 14
Louisville, KY
January 21
New York City, NY
January 21
February 25
Orlando, FL
January 29

Pittsburg, PA
March 3
Portland, OR
April 8
Sacramento, CA
March 19
San Diego, CA
February 11
San Jose, CA
January 21
Seattle, WA
February 18
Spokane, WA
May 20
St. Louis, MO
February 25
Tulsa, OK
February 19
Walnut Creek, CA
May 13
Washington, DC
January 15

DATACOMM BY MICOM

Introducing TRAPS.™

Captures bugs in your online systems.

For high quality, trouble-free software, TRAPS is the fast, inexpensive way to debug online host applications. PC-based and menu-driven, TRAPS records and stores test cases on your PC for later playback in any combination or order you choose. During playback, the system automatically compares the new host responses against the recorded responses. Differences are then saved in the PC for convenient review and edit off line. With TRAPS, you save time and money while delivering fully-tested, error-free code.

- Captures and compares keystrokes and screens to isolate errors automatically.
- Interacts with CICS, IMS, TSO, CMS, DB2 and more.
- Eliminates test data keystroke errors to ensure repeatability and consistency.
- Conserves host resources by using the PC for test case creation, storage, and maintenance.
- Provides portability of test scenarios via diskette or token ring to project teams, quality assurance, and end users.
- Generates detail reports showing mismatches, response times, and control information.
- Automates acceptance and regression testing through the project life cycle.

For more information, contact TRAVTECH, subsidiary of The Travelers, at (203) 277-9595.

TRAVTECH Inc
One Tower Square
Hartford, CT 06101

TRAPS™ is a trademark of The Travelers Companies.

Cruise control for cursors

From page 37

numeric keypad is the default key) for this and other control functions.

By pressing the combinations of "5" and "+" or of "5" and "-", you can increase or decrease the speed of cursor movement. This can be done from within the application program.

Cruise Control also lets any key function as an autorepeat key at any time. You simply press "5" and the key you want repeated. It will then be repeated until you press another key. If you want to page through a document with the Pgdn key, for example, you simply press "5" and Pgdn.

Eliminating buzz

The final basic function related to cursor control is the elimination of the annoying buzz from outrunning the keyboard buffer or getting to the end of a cursor movement range that goes on after you have released the key. Cruise Control gets rid of that.

Different application programs handle cursor control in somewhat different ways. Some, for example, create their own keyboard buffer, larger than the standard Microsoft Corp. MS-DOS or IBM PC-DOS buffer. Cruise Control lets you set, when the program is started, or change, via the "5" key in combination with the Tab key, the way Cruise Control does its job internally.

In this way, you can adapt Cruise Control to provide the best performance with any particular application program. Revolution Software provides a current list of the best strategy to use with most commonly used software.

The ability to toggle through with the hot-key facility, however, makes it easy to learn which is best simply by trying them all.

Installation is easy. All you really need to do is to copy the CRUISECOM file — it isn't copy protected — into the appropriate directory in your system's search path. An INSTALL program is included as well.

Technical support is provided through a number at Revolution Software's offices in Randolph, N.J. Chances are, however, that most users will find it unnecessary. The program is straightforward and unlikely to cause difficulty even for inexperienced users.

At a cost of $29.95, Cruise Control performs a useful set of functions and is well worth its modest price. It has certainly earned itself a permanent place in my system utilities directory.

Support plan debated

From page 37

hope it gets better."

The pay-for-support program is still somewhat of an experiment at Grumman. "This is the first year. We will check it out and decide what to do next year," Galgano said.

For Galgano, a key benefit to the program is access to prerelease copies of software for evaluation. Another benefit is more product training from Ashton-Tate.

But Galgano has a couple of suggestions for Ashton-Tate. "I would like to see more flexibility in the number of people that we can have on the list to call," she said. Currently only four employees are authorized to call for technical support. "And I hope to be notified in advance of known problems with the software," she said.

Another pay-for-support customer is Nynex Corp.'s Service Co. in Boston. "We support over 2,000 PCs and well over half use Ashton-Tate products. We feel it is imperative that we have a highly technical resource available if we need it," said Kathy McKinney, manager of technical support for end-user computer services at Nynex. In addition, Nynex is a heavy user of Ashton-Tate products on local-area networks, which are support intensive. "We recognize that support is a real cost," she said.

For another user support is worth the cost. "We have not taken advantage of it yet, but we are going to since $4,000 is peanuts. Whether we'll sign up in multiples, I don't know," said Karl Kendall, manager of micro support, Metropolitan Life, New York, referring to Ashton-Tate's most extensive support offering.

Campbell Soup, Smith Barney, The Commonwealth of Virginia and USAir have all benefited from Peat Marwick's unequalled information systems development experience.

Maybe you can, too.

In an area where experience really counts, you can count on Peat Marwick. Our experienced systems consultants bring you the highest level of expertise, whether your project involves systems planning, custom design and development, packaged software implementation or software re-engineering services.

Peat Marwick's systems consultants average more than ten years' experience. What this means to you is an unequalled opportunity to get more out of the system you are planning, developing, implementing or maintaining. Our consultants provide high quality, and reliable consulting services that will help take the risk out of your critical systems projects. And they will follow through to insure that your systems continue to perform at peak effectiveness.

You can benefit from the information systems skills that have helped some of the world's finest corporations and governments. For more information and a free copy of our systems brochure, "Meeting the Technology Challenge," send in the coupon below or call **1-800-344-3600.** (In Illinois, call 800-328-4200.)

CW-UM-1/26

Mail to: Peat, Marwick, Mitchell & Co.,
345 Park Ave., Box ISS, New York, N.Y. 10154

Name
Title
Company
Address
City
State Zip

PEAT MARWICK

Accounting and Auditing/
Tax Services/Management Consulting/
Information Systems Services

XIDEX

Tandem gives a leading disk producer results that are hard to copy.

Xidex, a leading producer of computer data storage disks, depends on real-time information, no downtime, modular expandability, networking simplicity, security and ease of programming.

Only one system could deliver all that. The Tandem NonStop™ system.

It handles order entry and accounting, as well as purchasing, receiving, billing, material requirements planning and process control. And it does three times the work of other systems with the same staff.

WE'RE COPY PROTECTED.
Nobody can match our unique, parallel architecture and single operating system. They allow you to expand in any increment you choose without ever rewriting applications. You can also set up networks that practically run themselves.

WE'RE MULTIPLYING.
That's why Tandem is not only busy in manufacturing, we're in finance, telecommunications, retailing, transportation, energy and government.

For more information, write: Tandem Computers Incorporated, 19191 Vallco Parkway, Loc. 4-31, Cupertino, CA 95014. Or call 800-482-6336.

TANDEM COMPUTERS
The technology leader in on-line transaction processing.

YOU'RE FACING
THE PROBLEMS.

NOW COME
FACE-TO-FACE
WITH THE
SOLUTIONS.

INTERFACE® '87

Co-sponsored by Data Communications and BusinessWeek

MARCH 30–APRIL 2, 1987
LAS VEGAS CONVENTION CENTER
LAS VEGAS, NEVADA

The force behind communications and information networking solutions, INTERFACE '87 unites you and other information and communications executives with the latest innovations and advancements in telecommunications and data communications equipment and services. Voice/data integration. Communications software. Information management. LAN applications. Peripherals. Fiber optic systems. Cabling systems. Office automation equipment and services. Satellites. Earth stations. The force behind greater productivity.

Corporate managers, information resource executives, senior communications and data processing directors, and operations managers rely on INTERFACE for the latest and most elite products and services — and to equip themselves with a range of new ideas and the latest techniques. It's time for you to gain the force you need for greater productivity.

THE FORCE FOR YOUR FUTURE

The INTERFACE '87 Conference refines your focus on the solutions you need by offering concentrated sessions on the most pressing

technical, applications and management issues. Industry experts explore such topics as Virtual Connectivity, Voice/Data Integration, Network Implementation, LANs, and lots more.

And a special, separately-priced seminar, The Executive Briefing, has been specially designed for senior information executives who need to understand how to turn information into a strategic management tool

Our keynote address, entitled "Information Resource Integration: Survival Strategy for the 1980s," probes one of the issues most critical to anyone connected with communications and information networking.

FIFTEEN YEARS BEHIND THE FORCE

INTERFACE has been the driving force behind the communications and information networking industry for fifteen years. And this year's gala 15th Anniversary celebration will launch the next fifteen in grand style. At the Awards Banquet, the annual Harry R. Karp Award will be presented to the author of the best management or technical paper delivered at the conference. The prestigious INTERFACE Award will be given for extraordinary contribution to the information industry.

And this year's show puts you in the heart of Las Vegas — the show city and excitement capital of the world.

REGISTER NOW!

INTERFACE helps you get on with the business of doing business by making your hotel accommodations and flight reservations, and by assuring you that your badge will be waiting for you when you arrive in Las Vegas.

All you have to do is complete and return the pre-registration form on the back—and we'll send you information on the big discounts on air travel and car rentals available to INTERFACE attendees. Act now!

COME FACE-TO-FACE WITH THE SOLUTIONS, THE INSIGHT, THE EXCITEMENT—
FILL OUT AND SEND IN THE REGISTRATION FORM TODAY!

© ®THE INTERFACE GROUP Inc

INTERFACE '87 CONFERENCE

INTERFACS PLENARIES

Users are growing increasingly apprehensive as vendors merge and purge, organize and reorganize, while there is increasing necessity to integrate their information resources and systems

IPL-1 KEYNOTE
Information Resources Integration
Survival Strategy for the 1980s

IPL-2 EARLY JAVA I
Mergers, Acquisitions, Alliances
Does the Large-Scale User Benefit?

IPL-3 EARLY JAVA II
AT&T and IBM Reorganizations
What to Expect

IPL-4 LOCKNOTE
Venture Capital's Impact on User Progress

BACKBONE NETWORKS

Critical issues include the design of such networks, the balancing of cost against traffic volumes, and interconnection from the backbone net to on-site premises

BBS-1 Net Designing with Wideband in Mind

BBS-2 Balancing Cost and Performance in Voice/Data Networks

BBS-3 Interconnection Issues

REGULATORY/LEGAL UPDATE FOR '87

Deregulatory activity didn't all come to an end with Judge Greene's decision on AT&T divestiture. The FCC and state public utility commissions have weighed in with their own contributions.

RLU-1 On the Docket in '87: User Concerns

RLU-2 Local Access Cost/Service Forum

RLU-3 Computer Inquiry III: What's Left for Users?

BASICS AND TUTORIALS

Newcomers to INTERFACE will appreciate these "grounding" sessions in fundamental subjects such as voice, datacomm, network design, SNA, T-1, Packet-Switching and ISDN. Treatment of these subjects, while introductory, is also authoritative

BAT-1 Basics I: The Voice Network

BAT-2 Basics II: DataComm Theory, Concepts and Components

BAT-3 Basics III: Network Topologies

BAT-4 T-1 Fundamentals

BAT-5 ISDN Overview

BAT-6 SNA Building Blocks

BAT-7 Packet-Switching Nets

APPLICATIONS ENVIRONMENT UPDATES

Business communications in the next decade will be dominated by the need to link desktops with mainframes, by the requirement for cost-effective mail (and "voice-mail") systems, by "workplace automation," by "image communications centers" and by a series of standardized protocols for precise management of industrial processes

AEU-1 Communicating with Departmental Computers

AEU-2 Mail-Message Systems that Optimize the X.400 Standard

AEU-3 Workplace Automation: New Framework for Integration

AEU-4 Image Communications Centers: Where They Fit

AEU-5 A Better MAP/TOP for the Factory Floor

NETWORK ENVIRONMENT ISSUES

It turns out that information networks proliferate, merge, consolidate and agglomerate almost as frequently as the organizations they serve! INTERFACE '87 examines nine aspects of this phenomenon ranging from the choice of network architecture to the hiring (and keeping) of qualified network professionals

NET-1 Choosing a Network Architecture for the Decade of the 90s

NET-2 Net-to-Net Connectivity Advances

NET-3 What's COS Doing for OSI and Other Proposed Standards?

NET-4 Software-Defined Networks: Who's Really in Control?

NET-5 Improving Your Private Network's P&L

NET-6 Preparing for ISDN Implementations

NET-7 Network Optimization with AI and Other Modeling Tools

NET-8 Network Security: Cost-Benefit Tradeoffs

NET-9 Hiring (and Keeping) Network Professionals

SOFTWARE THAT COMMUNICATES

While the annual bill for telecommunications hardware soars, there is an equally important rise in the cost of essential software. "Artificial intelligence" is increasingly important in network control, while users of desktop computers demand better access to mainframes

SFC-1 Net Control Software Adds AI

SFC-2 Voice Net Monitors and Optimizers

SFC-3 Micro/Mainframe Links to Access Mainframe Software

SFC-4 Micro Operating Systems in the Mainframe World

INTEGRATING DATA BASES

Desktop users can now have local mass storage of as much as 70-100 megabytes. The integration of these data bases with a mainframe data base is a priority for systems professionals and MIS directors

IDB-1 Integrating Micro and Mainframe Data Bases

IDB-2 Data Base Architectures for Application-Driven Networks

IDB-3 Data Base Packages for Remote Workstations

LAN ADVANCES FOR USERS

Is this finally "the year of the LAN?" Perhaps so as vendors and carriers wheel into position the building blocks, hardware and software, to make LANs both economically feasible and operationally desirable

LFU-1 LAN Utilization Survey

LFU-2 LAN Concepts and Architectures

LFU-3 Local Data Transport: More Options for Users

LFU-4 On-Premises Cabling (Workshop)

LFU-5 What's Coming in LAN Software: Servers and Gateways

APPLICATIONS SHOWCASE

Nobody knows the terrain better than the chap who's actually been there! That's the underlying premise for INTERFACE's annual survey of significant applications—as users themselves report on perils, pitfalls and payoffs!

APP-1 T-1 at Its Best

APP-2 The High Speed LAN

APP-3 Network for Science: Progress at NSF

APP-4 Fiber Optic Throughput: SPRINT Ahead

TECHNOLOGY HORIZONS

INTERFACE experts will survey network related technologies such as digitized voice, data compression, multi-processor architectures, CD-ROM and the network roles for 386-based desktops

TEH-1 Multi-Processor Architectures for Information Networks

TEH-2 Network Roles for 80386 Systems

TEH-3 Let's Hear It for Digitized Voice!

TEH-4 Data Compression: Tips and Trends

TEH-5 Where CD-ROM Can Fit in the Net Environment

COMMUNICATIONS PRODUCTS HIGHLIGHTS

Whether your immediate concern is the analysis of monthly telecommunications bills or selection of MODEMs and MUXs, you're sure to find sessions in this group guaranteed to make you a more sophisticated purchaser

CPH-1 Switch Architectures for the 1990s

CPH-2 What More to Expect from Centrex

CPH-3 Telephone Management Systems: Update for Users

CPH-4 Portable Terminals for Data Entry On-the-Go

CPH-5 The MODEM-MUX: Price/Performance Spectrum

CPH-6 Fiber Optics: What's New

INTERNATIONAL COMMUNICATIONS OUTLOOK

Unrestricted trans-border data flow is all too often more a goal than a reality. Multi-nationals will profit here from sessions on cost-saving trends worldwide telecomm deregulation and services available from overseas carriers

ICO-1 Cost-Saving Trends in Global Communications

ICO-2 Deregulation Worldwide: Where Users Can Benefit

ICO-3 Feature-Full Services from International Carriers

IMAGE COMMUNICATIONS ADVANCES

Time was when "data" was communicated: now it's information itself digitized for easier processing and transmission. Frequently, this information is in the form of a video signal or a graphics image, yet it's just more data for your systems to handle

ICA-1 Business Videotex Systems: Viewing the Potential

ICA-2 Off-the-Shelf Videotex Systems

ICA-3 Wideband Teleconferencing: Roundtable

ICA-4 Teleconferencing Alternatives

ICA-5 High Speed/High Res Communication of Text and Graphics

BUILDING BLOCKS FOR BYPASS

With local access costs skyrocketing, users seek to bypass the ministrations of the BOCs and their independent counterparts. Sessions here will include a user-vendor roundtable, with spontaneous discussion sure to provoke both controversy and attention!

BBB-1 Bypass vs. Local TELCO: Roundtable

BBB-2 A Plethora of Products for Metro Bypass

BBB-3 Bypassing Bottlenecks with V-SAT Networks

THE EXECUTIVE BRIEFING: THE STRATEGIC APPLICATION OF INFORMATION RESOURCES

Under the direction of network theoretician and consultant Dr. Howard Frank, this year's Information Executive Briefing has been designed to offer a full panapoly of strategic perspectives in one day, with even a bit of time left over to walk the exhibit floor! **(Special Registration required)**

TEB-1 Information-Driven Organizations: The Strategic Perspective

TEB-2 Leveraging the Payoff from Technology Advances

TEB-3 Planning the Application of Integrated Information Resources

TEB-4 Capital Investment Strategies for Major Information System Purchases

TEB-5 Network-Based Information for Executive Decision Making

TEB-6 Positioning Your Organization for Open Systems Interconnect (OSI)

Turn this page for registration form

INTERFACE.'87

Fifteenth Annual Conference & Exposition

Co-Sponsored by BusinessWeek and Data Communications

Attendee Pre-Registration Form

March 30 to April 2, 1987
Las Vegas Convention Center, Las Vegas, NV

Exhibit Hours: Monday, 11:00–5:00,
Tuesday, Wednesday 10:00–5:00, Thursday, 10:00–4:00

USE OF VIDEO CAMERAS RESTRICTED TO APPROVED NEWS ORGANIZATIONS.

NOT VALID FOR EXHIBITOR REGISTRATION

In order to pre-register and have your badge ready for you at the INTERFACE '87 Registration Desk **this form must be mailed to arrive at our offices in Needham, MA NO LATER THAN** Wednesday, March 18, 1987. Mail this form to the INTERFACE '87 Registration Department. After March 18, you must register on-site. Payments for Awards Banquet reservations must be received by March 13, 1987 to assure preferred seating. After March 13, seating will be on an "as available" basis. **Banquet tickets are non-refundable.**

Please print or type the information as you wish it to appear on your badge. **PERSONS UNDER THE AGE OF 16 ARE NOT PERMITTED ON THE EXHIBIT FLOOR.**

NAME	
TITLE	X PHONE — —
COMPANY	
COMPANY ADDRESS	
CITY	STATE ZIP
TELEX	
IF ADDRESS IS OUTSIDE U.S., PLEASE INDICATE POSTAL CODE & COUNTRY	

CONFERENCE & EXHIBIT REGISTRATION FEES

Please check the appropriate box. The Executive Briefing, Full and One day Conference Fees include admission to the Exhibit Floor.

- ☐ **BM**—The Executive Briefing *(Full Conference/Awards Banquet/ Luncheon/Interface Paper Proceedings)* $445
- ☐ **BA**—Full Conference & Awards Banquet *(Includes Interface Paper Proceedings)* $375
- ☐ **CF**—Full Conference *(Includes Interface Paper Proceedings)* $325
- ☐ **BO**—One Day Conference & Awards Banquet $240
- ☐ **CO**—One Day Conference $190
- ☐ **BC**—Exhibits Only & Awards Banquet $75
- ☐ **EO**—Exhibits Only $25

☐ My registration check is enclosed for $ _____
(Make payable to INTERFACE '87)

☐ Please bill me. My purchase order number is _____
(To avoid long lines at the Show, bill must be paid by March 23, 1987)

In the event of cancellation registration fee will be refunded if written notice is received prior to February 27, 1987. If notice is received on or after February 27, 1987, fee will be applied toward registration for INTERFACE '88.

ACCOMMODATIONS

(Complete this part of form if you require us to make your hotel reservations.)

To receive special "Conference Rates," our staff must make a reservation for you at the hotels listed below. Please indicate hotel choice by writing the numbers 1,2,3,4, and 5 and specify arrival and departure times.

IMPORTANT: All hotels require one night deposit plus 7% tax to assure your reservation. ***Wait until you receive our indication of your booking before sending the hotel deposit. Complete instructions will be enclosed.****

Choice	HOTEL	☐ Single	☐ Double
	Aladdin Hotel	$55	$55
	Bally's Las Vegas	$82	$82
	Caesars Palace	$75	$75
	Desert Inn (No Sat. Arrival)	$85	$85
	Dunes (No Sat. Arrival or Departures)	$62	$62
	Flamingo Hilton	$70	$70
	Frontier Hotel	$88	$88
	Holiday Inn Center Strip	$63	$63
	Landmark	$50	$50
	Maxim (No Sat. Arrival)	$49	$49
	Paddlewheel	$42	$42
	Sahara Hotel	$55	$55
	Sands	$70	$70
	Tropicana Hotel	$68	$68

***NOTE:** Changes, cancellation and refund policies are determined by the individual hotels.

Arrival Date _____ Departure Date _____

Share With _____

BILLING ADDRESS IF DIFFERENT FROM ABOVE:

_____

_____

_____

PLEASE CIRCLE ONE IN EACH GROUP BELOW.

BUSINESS OR INDUSTRY CLASSIFICATION

10 Mining, Petroleum, Energy, Exploration and Production
20 Process Manufacturing (Food, Fiber, Finished Goods, Chemicals)
33 Durable Manufacturing (Metals, Machinery, Electronics other than computers and peripherals)
35 Computer and Peripheral Equipment Manufacturing
40 Transportation Services and Storage
4A Utilities (Energy and Other Public Service Suppliers)
40 Communications (Broadcast, Telephone, Data Transmission)
50 Wholesale Retail Trade (Except Computers)
57 Computer Retail and Services
7A VAR/Systems House/Systems Integrator
60 Banking Credit, Savings and Loan/Securities, Insurance
65 Real Estate (Commercial and Residential)
70 Business and Consumer Services (Except Computer)
73 PR Advertising Publishing
80 Medical Services (Including Hospitals)
82 Education (Colleges, Universities, Schools, Professional Training Centers)
8B Accounting Services
91 Government (Foreign, Federal, State, Local)
A0 Student

I-A B

FUNCTION/TITLE

T1 Corporate Management CEO President Owner
BB Corporate Management VP Director Manager
T2 Administration Management
DD Administration Staff
T4 Financial Management VP CFO Director Manager
T1 Data/Telecommunications Management VP Director Manager
TJ Data/Telecommunications Staff
TK Network Systems Analysis
T5 MIS DP Management
T7 MIS DP Staff
TA Software Development Programming
TC Operations Manufacturing Management VP Director Manager
T8 Engineering R & D Management VP Director Manager
TE Sales VP Director Manager
TG Marketing VP Director Manager
TI Advertising PR
TN Purchasing
R Consulting

USAGE

U E End User
U Q End User Buying in OEM Quantities
U M OEM Systems Integrator
U R VAR Retailer

SIZE OF ORGANIZATION

JA Under 100 employees
JB 100-499
JC 500-999
JD 1000-4999
JE Over 5000

Mail this form with your registration and/or Banquet fees to:
INTERFACE • Registration Department • 300 First Avenue, Needham, MA 02194

FREE SHUTTLE BUS: INTERFACE will provide regular complimentary shuttle bus service between the Las Vegas Convention Center and most Show hotels.

Comments _____

_____

In Depth

How interruptible is your computer system?

Buying UPS is actually an insurance, not a technical, decision. MIS must determine not only whether to provide UPS, but how much protection is enough.

By ALAN RADDING

If a blackout were to throw the entire U.S. into chaos, only about 10% of the country's mainframes would still be up and running. These mainframes belong to those organizations that were farsighted enough — or scared enough — to install uninterruptible power supply (UPS) systems as protection for their computers and corporate data.

Most organizations do not start looking at UPS until after they have suffered a critical loss because of a sudden power outage. "Most people can't justify it until the last crash," says Murray Lazar, senior vice-president of K/W Control Systems, Inc. in Middletown, N.Y., a major vendor of UPS systems.

The reason so few computer systems are protected by a UPS is not a technical issue but a complex management issue. The decision to spend thousands, or in some cases millions, of dollars on a UPS system requires that management determine the hour-by-hour or even minute-by-minute value of the organization's operations. Recovery time as well as actual downtime must be considered, and the potential cost of possible hardware damage must be calculated.

Purchasing a UPS is an insurance decision, and like in every insurance decision, managers must take a calculated gamble. They must decide not only whether to install a UPS but also how much is enough.

They must decide if two minutes for an orderly shutdown is sufficient and weigh the risk to their system of, say, three days without power after a storm.

Other questions must be considered. What does the work force do when the computer is down? What is the effect on an organization's customers? What happens to communications within the organization and with the outside world? Are governmental or public safety mandates involved?

Fact of life

The reason for installing a UPS is based on a fact of life in the computer industry — that the machines require a steady source of the proper level of power. As recently as 10 years ago, computers would crash if power were interrupted for as little as one-quarter of a cycle, says Norm Woolard, a power and environmental specialist at Prime Computer, Inc.

Today's computers have better ride-through capability — or the length of time a computer can tolerate a loss of power — and can return to operation without problems after a loss of power for as long as 4 cycles, which is still only a fraction of a second.

For every kilovolt-ampere of power, Woolard notes, there is much more at stake. While these machines may be more tolerant of power fluctuations, they are also performing many more operations and handling much more data than computers of a decade ago.

Jan Cates, manager of operations control at Duke Power Co. in Charlotte, N.C., had to wrestle with this inverted logic as he planned the utility's own UPS system. His

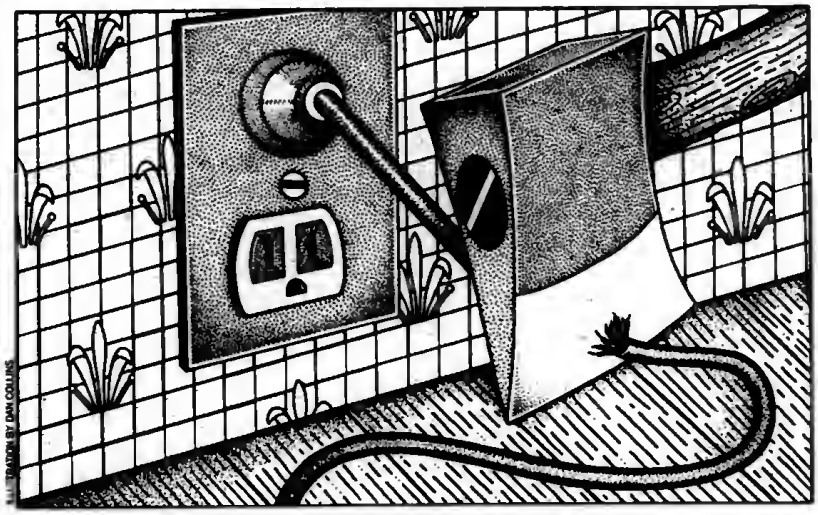


ILLUSTRATION BY DAN COLLINS

About the author
Radding is a Boston-based author specializing in business and technology.

> ***Figuring the cost of a power outage is not a straightforward calculation. There is the cost of the actual outage — hardware damage or data lost in a computer crash or through disk drive damage. Determining the cost of recovery — for both hardware and data — could take much longer.***

computers were requiring less power to perform more computing, but, he explains, "the power was becoming much more concentrated. We were looking at a much higher wattage per square foot."

Figuring the cost of a power outage is not a straightforward calculation. There is the cost of the actual outage — hardware damage or data lost in a computer crash or through disk drive damage.

Determining the cost of recovery — for both hardware and data — could take much longer. And there is the potential cost of hardware problems from the sudden power drop and return surge.

Finally, there are intangible costs, such as the effects of telling customers their data has been lost, losing business that goes somewhere else when you stop taking transactions or sending employees home.

The technology for UPS is readily available: More than 175 vendors are selling what each considers to be UPS equipment, one UPS salesman complains.

Out of the woodwork

At least several dozen of these are well-known, highly regarded electronics manufacturers.

A major power outage brings these UPS salesmen out of the woodwork.

In the aftermath of a major power loss, "As soon as the power came back on, I started getting calls from dozens of UPS companies," says the engineer for a small, completely automated broadcasting facility located in downtown Boston, which was already equipped with 45 minutes of UPS battery backup.

Fidelity Systems Co. in Boston was the victim of a major power loss late in March 1983, when a midday explosion and fire in an electric company manhole cut off all the power to blocks of office buildings that were located in the city's financial district.

"The power was out for five days," recalls Michael Simmons, president of Fidelity Systems, the division of the Fidelity Investments money-market funds organization that is responsible for computer operations.

Fidelity's computer systems went down, and thousands of financial transactions totaling millions of dollars stopped.

The computers remained out of service for 22 hours until the company could bring in rented diesel generators mounted on large flatbed trucks and patch them into the building's electric power distribution system, bypassing the Boston Edison Co. system entirely.

Today, if a major power blackout were to occur, "nothing would happen" at Fidelity, Simmons says. "We wouldn't care, and most people probably wouldn't even notice."

In the aftermath of the March 1983 blackout, the company installed an extensive UPS.

Fidelity's decision to spend a couple of million dollars was a clear-cut one. After learning the lesson of March 1983, the company realized that when its computers went down, it was out of business.

A smaller but still severe power outage that occurred later, in October, confirmed the company's decision to install a complete UPS system. The cost of the UPS system "if figured over time, is not as much as an insurance policy," Simmons says.

The company did more than just install a UPS system: It developed an entire plan to continue its essential operations on a restricted power basis and built

The Secret To Maximizing Your 4381's Performance Lies In The Cards.

Main storage upgrades are the most reliable and cost-effective way to improve the performance of your 4381 computer. But only EMC main storage upgrades let you *maximize* the power of your 4381 computer system.

That's because only EMC provides main storage upgrades which perform memory writes twice as fast as IBM's main storage cards.

EMC's Main Storage Cards Run Cycles Around IBM's Cards. How do we do it? Simple. Our upgrades use newer technology to perform a memory write in 11 processor cycles. It takes IBM's upgrade 22 cycles to perform the same memory write. This means our upgrades increase the availability of main storage to your 4381's processor and take advantage of otherwise wasted CPU cycles.

With EMC main storage upgrades you avoid the expense of a model upgrade while still getting the performance you need to meet increasing demands on your computing resources.

Maximized Performance is Only the Beginning. As the world's largest independent manufacturer of main storage upgrades for IBM's mid-range computers, we deliver a lot more than just improved performance.

Start with reliability. All our upgrades for the 4381 undergo a 100-hour test and burn-in procedure, including qualification in a 4381 computer.

Then there's your $20,000 savings on every 8MB upgrade, and a guarantee that use of our upgrades will have no effect on your IBM maintenance service.

Plus our coterminous leases, immediate delivery and responsive service programs.

To find out more about EMC's high-performance main storage upgrades for your 4381 computer, call today or write: EMC Corporation, Natick Industrial Centre, Natick, MA 01760.

For more information, call today:

1-800-222-EMC2

(In MA, call 617-655-6600)

In Canada: 416-366-4726. In England: (08385) 2434. In Germany: (0619b) 481 885.

IBM is a registered trademark of International Business Machines Corp.
Copyright EMC Corp. 1986

EMC² No one is more committed to memory.

★ EXTRA ★

FIND CARGO LOST AT SEA!

ITT rushes aid to fleet

A California shipping agent, who used to worry about keeping in touch with a worldwide fleet of container ships by telex, called his operation "shipshape" today.

Bill Lowe, a manager for Los Angeles-based Merit Steamship Agency, Inc., added that ITT Worldcom experts had made it "much, much easier" to transmit cargo schedules.

Merit, a nationwide shipping agency, is one of the few agencies to represent a number of steamship companies in worldwide cargo transport, Mr. Lowe explained.

"We dispatch over 40,000 telex messages a month," he said. "So we really needed a first-rate communications network to keep our customers on top of their imports and exports."

BACK IN TOUCH—Shipping agent Bill Lowe after rescue.

Service...and Savings.

ITT Worldcom solved all the sticky problems that Merit faced with its last international carrier, Mr. Lowe pointed out. "And they even cut some of our costs—by 50%!"

Among Merit's major clients is Japan Line, which each year moves thousands of containerized shipments, inland and overseas.

ITT Worldcom created a super-efficient network between Merit's 14 U.S. locations and Japan Line's Tokyo headquarters.

This network includes customized communications software, plus ITT's sophisticated Worldbridge℠ family of networking, office automation and electronic messaging services.

Let the ITT Lifesavers go to work for you. Call 1-800-922-0184. Or mail our coupon.

ITT WORLDCOM. WE COULD BE YOUR LIFESAVER.℠

Name _____ Title _____

Company _____

Address _____ City _____

State _____ Zip _____

ITT World Communications
Dept CR-A
100 Plaza Drive Secaucus, N.J. 07096

COMMUNICATIONS SERVICES VIA ITT

© 1986 ITT World Communications Inc

into its UPS requirements enough capacity to take care of those needs. Keeping only the computers running would preserve data and prevent possible hardware problems but would not in itself keep the company operating.

If the power problem were to last longer than a few minutes, Fidelity's department managers, following a predetermined plan, would start switching off power selectively. Only a minimum level of operation would be maintained, keeping elevator service, lights, phones and necessary accessories running to accompany the computers.

Today, Fidelity uses a total of 196 Exide Electronics Corp. batteries, which provide its computers with up to 15 minutes of power to cover brief disturbances in the public power supply. Long before this first source gives out, twin 820-kVA diesel generators kick on. As soon as these diesels are running, responsibility for generating power is automatically transferred to them. The diesels can run nonstop for 72 hours before they need to be refueled and can be relied upon almost indefinitely.

> ***UPS covers a broad range of devices and capabilities, ranging from a few batteries built into a surge protector to large battery racks coupled with backup diesel generators.***

Who uses UPS and why?

The term "uninterruptible power supply" covers a broad range of devices and capabilities, ranging from a few batteries built into a surge protector, which provide two minutes for a graceful shutdown of the computer, to large battery racks coupled with backup diesel generators to provide a true UPS for a long duration.

Technically, a UPS system is a group of devices that sits between the electronic equipment and the public power supply to ensure a constant, stable supply of power.

A fully configured UPS system typically involves batteries, rectifier, inverter and transfer switching.

The system senses when the power supply is fluctuating and compensates for it. An alternative power source, such as a diesel generator, is often the final component of a UPS system.

In the past, UPS was considered appropriate only for large businesses that relied heavily on mainframes, particularly financial companies. Increasingly, though, UPS manufacturers have seen growing interest from small companies.

"Mom and Pop operations that are dependent on their small computer need UPS, too," says Ken Bates, a sales engineer at Bates and Associates in Abington, Mass., an Exide Electronics value-added reseller.

Large systems, defined by Bates as those requiring 15 kW/3-phase power or more, need extensive UPS systems; about 35% of those UPS installations ultimately provide for some kind of alternative power such as diesel generators.

For systems requiring 15 kW or less, computer operators tend to rely on a battery-based UPS that provides from two to 15 minutes of power for an orderly shutdown, "and then they just wait out the power failure," Bates says.

UPS systems fall into two basic categories: on-line and off-line. Simplified, an on-line system runs public power through the batteries, a process in which the batteries are constantly being charged.

If the public power fails, the batteries are already operating and able to compensate instantly for the power loss.

The batteries will carry the system for a limited amount of time until it can be shut down in a safe, orderly fashion or until an alternative power source can be brought into service.

In an off-line system, the batteries sit fully charged but idle until the load is transferred to them during a power fluctuation.

Improvements in the speed of electronic switching (typically six milliseconds) have made off-line systems, which are considerably less expensive than on-line systems, much more reliable, especially in smaller systems, notes Bill Niemann, Boston district sales manager for Topaz Electronics, a San Diego-based UPS manufacturer.

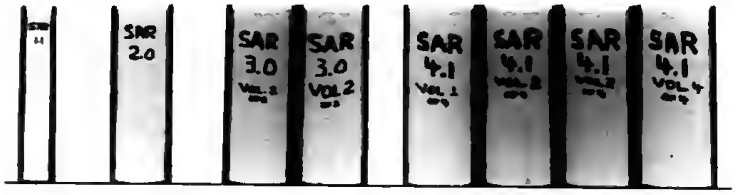
Who's buying; who's not

"A computer is production machinery for a bank," says George DiNardo, executive vice-president of Mellon Bank N.A. in Pittsburgh. When the computer is down, production stops, he explains, noting the electrical supply system is the Achilles' heel of that machinery.

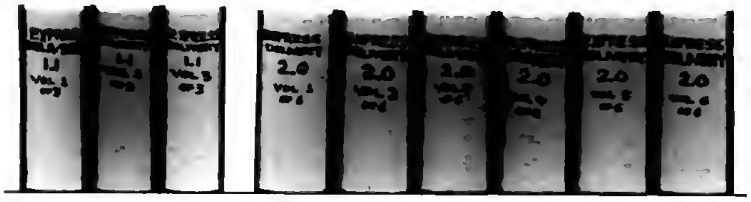
Mellon Bank provides computer services for 500 banks in 30 states and is subject to a ruling by the federal comptroller of the currency that requires it to have backup power, according to DiNardo. In addition, he says, "the board of directors are on your back if the computers are down."

But it was a natural disaster, not a federal regulator or the board of directors, that pushed the bank into a decision to proceed with a UPS system 12 years ago. After ice jammed the rivers around Pittsburgh in spring 1974 and water came within

The Fastest Growing System Software In The Industry



SAR- SYSOUT ARCHIVAL AND RETRIEVAL SYSTEM



EXPRESS DELIVERY REPORT DISTRIBUTION AND TRACKING SYSTEM

If you are an IBM mainframe shop, and are interested in growing with us, please contact JCA Software for more information.

18201 Von Karman Ave.
Suite 410
Irvine, CA 92715
(714) 863-9500
TWX 2771713 JCA

JCA SOFTWARE INC.

ESSENTIAL SOFTWARE INC.

one foot of the power generating station that supplied the bank, work began on a UPS system.

"We were frightened and moved as fast as possible," DiNardo says. Now the bank maintains battery capacity equal to two World War II submarines — which ran on batteries when submerged — has two 12,000-horsepower diesel turbines and is installing a third.

When the John C. Lincoln Hospital and Health Center in Phoenix converted to a full on-line system in 1984, the hospital, which already maintained one UPS system for its life-support equipment, made the decision to add a full UPS system, including diesel power backup.

"When we were just handling admitting or payroll, we could get by without UPS," says John Eric Thomas, the hospital's director of information systems and services. But when the system started to handle all aspects of the hospital's work, eventually including medical testing, a UPS system became important.

Not every organization comes to the same conclusion. Russell Stevenson, senior systems analyst at Campbell Soup Co. in New Jersey, reports that the company considered a UPS system for the computers used in manufacturing processing but ultimately decided against it for budgetary reasons.

The company has never experienced a critical crash due to power failure. "The computer recovers itself. It closes its files. We'd only lose what's in flight," Stevenson says.

Foodarama Supermarkets, Inc., based in Freehold, N.J., has looked at UPS systems for its point-of-sale terminals but decided against installing one, mainly because the benefits do not outweigh the expense, says Ken Warner, manager of operations.

"We've never had a crisis where we've had to recreate files," he explains. His computer manages to ride through small glitches in the power supply.

Chubb Life America does not use a UPS system either, although the company is just starting to look into the situation, says Marty Wagner, Chubb's director of computer operations.

The company has never experienced a catastrophic power failure, although periodic outages have brought the computer to a halt. "So far, it isn't something that justifies the cost, considering the downtime that we've experienced," she says.

Beyond utilities' control

The power companies are not much help when it comes to providing reliable power. Most utilities perform to specifications, but those specifications are inadequate for reliable computer operations. Utilities deliver the stated voltage with a variance of ±10%, "but they are often talking about a one-minute time frame," which is unacceptable for a computer, Prime's Woolard says.

Boston Edison admits as much. "Voltage variations or electrical disturbances may occur at any time and are beyond the control of Boston Edison," the company states in a pamphlet entitled "Minimizing the Effect of Power Variations on Sensitive Electronic Equipment."

"It is physically and economically impossible to offer 100% reliable power," a Boston Edison spokeswoman explains, saying there are

> ***Once it has been determined that a UPS system is required, the organization must decide exactly how extensive a system is desired and whether the system is to be part of an overall emergency operating procedure.***

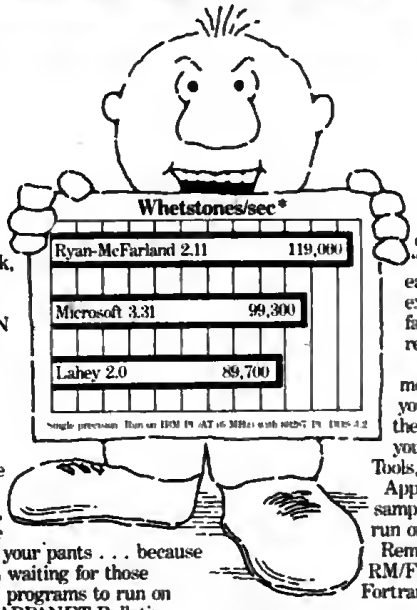
Creative freedom for the desktop publisher.

CompuScan's low-cost Personal Computer Scanner (PCS) and Image Editing Software Package enables you to enter existing art and text into your IBM-compatible PC, then modify it in any way you want. And it's compatible with most popular word processing and desktop publishing software packages. Call toll-free 1-800-631-0951. In NJ, 201-575-0500.

CompuScan PCS

Imagine what our input can do for your output.

KILLER FORTRAN.



This is the one.

Whatever the yardstick, RM/FORTRAN™ blows the others away.

Sieve? RM/FORTRAN runs 26% to 228% faster.

Whetstones? RM/FORTRAN is 20% to 33% better.

And those aren't our benchmarks. They're the industry standards.

With RM/FORTRAN, you can actually feel the difference in the seat of your pants . . . because you'll do less sitting and waiting for those big, complex mainframe programs to run on your micro. In fact, an ARPANET Bulletin Board user said, ". . . for serious conversion work of mainframe Fortran code, use the Ryan-McFarland . . ."

RM/FORTRAN is also the first and only PC Fortran GSA certified at Full Level ANSI 77 with no discrepancies. So programs move effortlessly from your mainframe to a PC, XT, AT or compatible. And they also port to 68000-based systems or new 80386 machines. You may already be using version 1.0 under the name "IBM PC Professional Fortran by Ryan-McFarland."

RM/FORTRAN comes with popular extensions from VAX, VS and Fortran 66. That's more mainline mainframe extensions than any other micro Fortran.

And there's more. PC TECH Journal, for example, said our "compiler's documentation, ease of use, speed of execution, and debugging facilities place it first for recommendation."

But why spend any more time reading when you should be filling out the coupon and getting your free "RM/FORTRAN Tools, Utilities and Applications Directory" and sample benchmark programs to run on your own PC.

Remember, if it isn't RM/FORTRAN, it's just a Fortran also-ran.

Ryan-McFarland
609 Deep Valley Drive
Rolling Hills Estates, CA 90274
or call 213-541-4928

RYAN-McFARLAND

Knock me out. Send me the benchmark programs and the free Applications Directory. CW 1

Name

Company Title

Street

City State Zip

Phone ( )

Choosing the best test plan

By GEORGE DANBURY

Acceptance test plans for data center power systems are offered in varying levels of complexity and flexibility, depending on the equipment involved and the level of performance verification desired by the customer. Vendors offer three different test plans.

Basic test plan. The basic test plan is designed for the customer who desires an acceptance test for a single uninterruptible power supply (UPS) module.

This plan consists of a series of four tests designed to verify the most critical performance parameters of a UPS module. These include the following:

- Documented functional test.
- Voltage regulation test.
- Transient response test.
- Battery rundown test.

Standard test plan. The standard test plan is designed for customers whose acceptance requirements are more comprehensive than those covered by the basic plan.

The standard plan consists of a series of tests designed to verify a majority of the manufacturer's performance specifications. It may cover virtually all of the equipment in the total power system, including 60- and 415Hz UPS modules, 60- and 415Hz frequency converters, 60Hz power stabilizers, battery systems, paralleling systems, power distribution systems, monitoring and management systems and associated switch gear.

The tests include the following:

- Documented functional test.
- Voltage regulation test.
- Transient response test.
- Battery rundown test.
- Efficiency test.
- Total harmonic distortion test.
- Thermal scan.

Additional tests may be specified by the customer to meet specific site requirements.

Comprehensive test plan. This plan is designed to measure virtually all of the manufacturer's performance criteria for all components of the total power system as well as site-specific conditions affecting the total power system. This test plan can include the following:

- Documented functional test.
- Voltage regulation test.
- Battery rundown test.
- Efficiency test.
- Total harmonic distortion test.
- Overload test.
- Unbalanced load test.
- Frequency regulation test.
- Dynamic signal analysis.
- Internal redundancy test.
- Signature analysis.
- Infrared (video) record.

Additional tests may be added to this plan to meet specific customer and site requirements.

Documented results of on-site acceptance tests performed in accordance with the above-mentioned test plans are recorded in the field on portable computers and are later incorporated into a final, computerized acceptance test report. ■

Danbury is vice-president of K/W Control Systems, Inc., Middletown, N.Y., a UPS vendor.

simply too many mechanical elements that are subject to breakdown. In general, utilities are vulnerable to storms, fires and other natural disasters.

For sensitive electronic equipment, Boston Edison recommends the use of dedicated circuits, in-house transformers and the specification of low-impedance equipment.

In addition, the power company suggests the use of surge suppressors, regulators, motor generators equipped with heavy flywheel and, finally, a UPS system.

The first determination an organization must make is whether it needs a UPS system at all. According to K/W Control's Lazar, "the cure could be worse than the disease." After a company totals up the costs of the UPS system, installation, additional space requirements, special considerations or municipal permits to accommodate the system and maintenance, not to mention the additional energy costs, and compares all that with the cost of a power outage including downtime, recovery time, damaged data, hardware damage and customer and employee relations, a UPS system may not be the right solution.

Do you need a UPS?

Not every power problem and computer crash requires a UPS solution. A properly planned and prepared site will eliminate many power problems. For instance, poor grounding of the existing power distribution system, resulting in power-line noise, is a major source of crashes that appear to be the result of momentary power failures, Woolard says.

Of the problems he is called upon to solve, he adds, 20% can be corrected simply through proper rewiring. Before an organization invests in UPS to compensate for suspected momentary disruptions in power, experts suggest investing in a site study and power monitoring.

Once it has been determined that a UPS system is required, the organization must decide exactly how extensive a system is desired and whether the system is to be part of an overall emergency operating procedure. The choices vary. Comprehensive on-line systems like Fidelity's are part of a total plan that allows a reduced but acceptable level of operation to continue uninterrupted through the power outage.

Small, off-line UPS systems are available that use a few maintenance-free sealed batteries to provide only several minutes of emergency power, enough for what is euphemistically called a graceful shutdown. A graceful shutdown, "if you can call coming to a sudden screeching halt graceful," one MIS manager observes, allows a company to preserve all data, properly close all files and prevent hardware problems, but it does not allow the computer to continue operating during the outage. It saves the time-consuming and costly job of reconstructing files once power is resumed.

Since the majority of power outages take the form of momentary interruptions that might destroy data and damage hardware but would not otherwise put a computer operation out of commission for hours or days, this type of system is ideal for many smaller organizations, Bates notes.

Columbia Savings and Loan Association in Fair Lawn, N.J., installed its UPS system with alternative diesel power five years ago when it moved to its current location. At its old site, Columbia had nothing. Power problems never destroyed data files, but they wreaked havoc with the programming, reports Margaret Kaneftke, manager of computer operations. "We would have to go back and start from the beginning," she says.

The power outages also damaged the hardware. Comparing that experience with her system now, she concludes, "if you can't have a full system with a generator, at least have some kind of battery backup."

Implementation considerations

If you decide to keep the computer running through a shutdown, how much more equipment do you need to keep powered? You probably will want storage devices and some terminals, but do you need printers? You need some lights. Air conditioning is necessary for some computers, and, in the case of water-cooled machines, pumps must be kept running as well.

Finally, you must project your needs three or five years ahead. "Not only do people have to think about their immediate needs, but their future needs, at least the near future," Topaz's Niemann says.

The problem of bringing UPS into a company is half managerial and half technical, says Robert Bicknell, vice-president of data center operations at First National Bank of Cincinnati, which put an extensive UPS system into its new computer center. Management must decide the insurance question, but the technical staff must implement the actual system.

The first task of implementation is determining the load. K/W Control's Lazar suggests two possible methods. One is to add up the stated power consumption figures for each piece of equipment for which UPS will be provided and reduce the total by 30%. An alternative method is to calculate power consumption by figuring 50 watts per square foot of computer room.

Once a company has determined its current power needs, it should consider its future needs. For instance, Brockway, Inc. Airline Division, which recently expanded its computer center to six processors, is planning a UPS installation now, but it is planning its system to support eight processors. Because of where the size breaks come with diesel generators, however, a unit large enough to support eight processors will actually support 10 or 12, which

Compute the relational DBMS solution.

Relational PC database environment

+ 4GL development tools

+ PC speed and power

+ DB2, SQL/DS compatibility

SQL WorkStation™

800-323-6361

In Illinois or Canada, 312-961-5700

DBMS, Inc. 117 Park Street, Naperville, Illinois

allows the company room to expand at a later date, notes Robert D'Orazio, Brockway's manager of data processing.

Environmental considerations must be heeded as well. UPS systems require space for racks of batteries, switching equipment, alternative generators and fuel. Ventilation provisions must be considered, and various municipal permits, such as for fuel storage, may be required. "When we built this facility, we thought our needs through and got everything approved for the UPS when we obtained the building permits," D'Orazio says.

Finally, access must be provided. The UPS system does not have to be adjacent to the computer room, but the farther away the UPS system is, the more power will be lost on the way to the computer.

Nonlinearity

The biggest technical problem encountered with UPS systems is the problem of supplying enough power to support a nonlinear load. Ideally, computers prefer a clean 60Hz sine wave, but because the load in a computer room is nonlinear, distortion — most often visible as wavy lines on the CRT — is introduced. Similarly, Lazar warns, diesel generators can introduce distortion when the full load of the computer system hits them. A key test for any UPS system is how well it handles these nonlinear loads.

To avoid or solve these problems, "coordination between the UPS vendor and the user is mandatory," Lazar says.

None of the UPS system users contacted about their systems reported any problems with nonlinear loads or inaccurate specifications.

Careful specification of the system and detailed screening of vendors eliminate many of these problems. "More consultants are specifying the equipment, and the DP managers are much more sophisticated. They are specifying UPS systems as carefully as they specify disk drives," Lazar notes.

Pricing a system

The cost of UPS systems varies as widely as the computer systems being protected. As a rule of thumb, Niemann suggests that one dollar per watt for the new off-line systems is a good estimate. Bates estimates that on-line UPS systems for mainframe machines will start in the tens of thousands of dollars and run into hundreds of thousands of dollars.

Smaller systems can cost $5,000 to $25,000, or an estimated $500 to $1,000 per kilovolt-ampere. A UPS system that is part of an overall emergency operating system like Fidelity's can cost several million dollars.

UPS systems are not installed overnight. A complete on-line system with diesel generators takes six to eight months to install, while small systems can be installed in a few weeks. Major installations, such as the UPS system installed in the New York Stock Exchange, are installed in phases over a period of months or years. An optimal time to install a UPS system is when a new computer facility is being built or an existing facility is being expanded.

The final step in implementation is the ongoing system testing and maintenance. A UPS system is supposed to eliminate technical problems, but, if it is not regularly maintained and tested, it can become just another piece of equipment prone to failure. Because the system is not in daily use, potential problems are less likely to be discovered casually at the most inappropriate time — before a critical failure.

A typical testing routine is to turn on the diesel generators weekly, check out the system under load quarterly and extensively test the entire system under full load at least twice each year.

> ***Nobody likes to buy insurance of any kind. It is an expense that, under ordinary circumstances, can be done without. When circumstances are not ordinary, however, insurance suddenly appears to be a smart buy.***

When UPS is a smart buy

Nobody likes to buy insurance of any kind. It is an expense that, under ordinary circumstances, can be done without. When circumstances are not ordinary, however, insurance suddenly appears to be a smart buy.

Eventually, anyone with an integral computer operation is going to have to confront the question of UPS. Nobody is predicting what will happen in coming years, and many forecasters are suggesting that the situation will get worse because few new modern power plants are coming on-line. To protect themselves, computer managers will insist on more control over the power supply.

Since Fidelity installed its UPS system, about 20 unplanned instances have occurred when the UPS has switched on, Simmons estimates. While none of the subsequent power outages have been as dramatic as the March 1983 fire, each would have shut down the computer system.

From Simmons' perspective, the millions the company spent on the UPS system keeps looking more like a bargain. ■

The stat mux that turns phone lines into lifelines.

Introducing Stat Mux Deluxe.

MIS managers can't risk their equipment investment without risking their careers. That's why they usually specify the MICOM BOX™ Type 2 Stat Mux. You see, our Stat Mux Deluxe is modular. At a moment's notice, you can expand it from 4 to 16 channels, and add integral modems or digital data service units. Which means that changes and upgrades are easy and your investment is protected.

The Stat Mux Deluxe also protects your investment by protecting you from leased line failures. It constantly monitors leased lines, detects errors, and responds to them, so no data is ever lost. What's more, autodial fallback and leased line return need no operator intervention.

To simplify things even further, our Command Facility is menu driven and can be operated from any async terminal in your network. And a built-in keypad gives you full local control of the Stat Mux Deluxe.

Call our toll-free number for applications assistance, answers to perplexing multiplexing questions, or even friendly reassurance.

It's the stat mux feature that many users say is the most deluxe of all.

1-800-MICOM-US

DATACOMM BY

More ways to help computers do more.

MICOM Systems, Inc.,
4100 Los Angeles Avenue, Simi Valley, CA 93062-8100.
Europe: UK (44) (635) 832441. Int'l-USA (1) (805) 583-8600.
MICOM BOX and FEATUREPAK are trademarks of MICOM Systems.

ONE
An integrated departmental system
PLUS

The industry's broadest—and most cost-effective—document exchange capabilities.

Now departments can get full office functionality and at the same time protect and enhance their existing investment in PCs and Wang systems. With the addition of ONE PLUS Departmental Systems from Honeywell.

ONE PLUS's unique library facility, ONExchange, lets departments, work groups and entire companies integrate their islands of PCs and Wang office systems for improved information sharing and business performance.

Transparent Document and Spreadsheet Exchange

Now users can create, transfer, revise and store documents in native formats among IBM compatible PCs using WordStar, MultiMate, DisplayWrite 2 and 3, as well as with Wang OIS and VS systems, and Honeywell systems. Automatically. Transparently.

With ONE PLUS, anyone running MultiMate on their PC can now send a document to Wang OIS or VS users who will automatically see it in their native format. The Wang users can, in turn, store or revise the document and send it to a WordStar user. And so on.

Similarly, commodity spreadsheets such as Lotus 1-2-3 can be stored in native format within the ONExchange Library and shared among multiple workstations or used as input to other

spreadsheet systems such as Honeywell's ONEcalc.

Investment Protection, Shared Services

This ability to unite multi-vendor environments means you can greatly expand the versatility of your current hardware investments, and dramatically improve productivity and the quality of business decisions.

ONE PLUS also extends the benefits of shared services to your PC users by providing them with the full range of Honeywell's integrated business functionality including electronic mail, time management, advanced networking and communications and powerful transaction processing. And that's not all.

Easy Database Access

With our ORACLE and SQL-based data extraction facility, ONEbase, users can enjoy highly simplified, controlled access to mainframe databases. Sales, marketing, inventory, scheduling, financial, manufacturing or other production databases can be accessed easily for immediate reports and analysis.

Naturally, ONE PLUS is backed by TotalCare, Honeywell's worldwide, comprehensive hardware and software service and support.

ONE PLUS is obviously much more than just another integrated information system. With integrated SNA and DISOSS communications, distributed database access for the non-programmer, and advanced document transfer, it's the industry's best solution to integrating the IBM and/or Wang environment.

If your office information problems have gone on too long, let us show you our approach to integration.

For more information,
call 1-800-328-5111, ext. 9712 or write
Honeywell Information Systems, MS440,
200 Smith Street, Waltham, MA 02154.

Together, we can find the answers.

Honeywell

BAR
MAN

MANAGEMENT

TAKING CHARGE
James L. Young

Your style as manager

Years ago, Gerald Weinberg published a book entitled *The Psychology of Computer Programming*. It was a landmark statement focusing attention on a new dimension of a new profession that had been seen as a largely technical practice. It was also an important step because it emphasized not just personnel management issues but also environmental needs, such as group dynamics and work habits, that were seen as unique or at least highly individualized.

That same analysis needs to be applied to data processing management. Unlike Weinberg, it is doubtful we would find a single distinctive profile but rather a diverse assortment of attributes, motivations and behaviors with one thing in common: the management of the discipline of data processing.

In our effort to master the art of managing the data processing resource, we frequently overlook fundamental elements of our job. We look at the technical side, the management practices and techniques and we try to be diligent about the financial component of our responsibilities, but we ignore that component that is our own makeup. All too frequently, it is the most important component. *Our management style and personality frequently determine the fit with a particular job and contribute to our success and enjoyment or become barriers to achieving them.*

As one example, an extremely dedicated data processing manager worked hard to become part of the top manage-

See **YOUR** page 54

Young is a principal of Worcester, Mass.-based Arthur Young.

Taking care of business

DEC's MIS manager takes aim at inventory and sales

By David A. Ludlum

With his employer riding a business boom driven largely by its supple technology, the director of Digital Equipment Corp.'s information systems might be expected to champion the use of the latest gadgetry.

But Belford E. Cross, who holds the title of corporate manager of Digital Information Systems, is a former manufacturing executive given to describing his work in terms of inventory turns rather than instructions per second.

DEC's Cross

Just as DEC lately has worked to tailor its sophisticated technology to the dictates of the market, the company has shifted the focus of its corporate information systems function to business concerns.

Nearly three years ago, Cross — then a group manufacturing manager for Ethernet who had begun his career at DEC as an engineer and later started up a plant in Maine — was asked to interview for the top information systems job.

"There was a belief that there was an excellent architecture, excellent products and a forward-leaning technical strategy but a lack of integration with business requirements," says Cross, a trim, soft-spoken skiing enthusiast and father of two.

DEC sought someone who understood its business — the culture and the way decisions are made — with experience in getting things done, such as building plants and delivering products, and with credibility among line functions. "Someone who wouldn't be perceived as a techie but as someone who understood the factory floor," according to Cross.

DEC also needed someone with a reasonable technical background and credibility within the information systems department. The job calls for challenging the information systems staff to work on the most significant business problems rather than on the most appealing technology, Cross says.

A year earlier, DEC had shifted corporate information systems' reporting relationship, moving the function from finance to operations, a change aimed at making better use of the technology, observes Cross, who reports to Winston Hindle Jr., who holds the position of senior

See **TAKING** page 56

INSTANT ANALYSIS

"Senior management must take responsibility for the planning, funding, implementation, testing and certification of an alternate processing strategy."

— **Irene E. Isaac, from the "Guide on Selecting ADP Backup Processing Alternatives," issued by the National Bureau of Standards of the U.S. Department of Commerce**

Fire enlightens Boston users

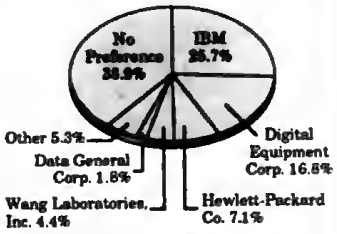
By Donna Raimondi

BOSTON — A fire that recently struck a 42-story building here in the financial district has shed some light on the question of how much disaster protection is enough. While the fire did not destroy data centers, it gave victims food for thought.

One Post Office Square was rocked by explosions at 5:45 p.m. Dec. 9 as its electrical switches blew, injuring nine occupants, two seriously. For the next week the build-

See **BOSTON** page 56

•DATA VIEW
Open market
Preferred departmental system vendors



INFORMATION PROVIDED BY THE SIERRA GROUP, 1986

MANAGEMENT MEMO

Typical senior exec changed focus, now earns $215,000

The typical senior executive at a Fortune 1,000 company made his major career breakthrough at age 34 and attributes it to being in the right place at the right time and to having moved from one functional area to another, according to a survey.

The executive, now 51 years old, was earning $100,000 a year by the time he was 35, as a vice-president, and currently pulls down compensation of $215,000 a year.

However, he said he defines success as enjoying work and effecting change; money is a secondary consideration. Public recognition is not particularly important.

These are among the facets of the typical Fortune 1,000 manager at or near the level of vice-president that emerged from a survey by Los Angeles-based executive search firm Korn/Ferry International.

Self-portraits

The survey, based on more than 1,300 responses, reflects the executives' views of themselves. Korn/Ferry conducted the survey in 1985 and recently released a full report, including a profile of the typical respondent.

That typical executive said he believes concern for results and an urge for responsibility are necessary for success in business and that he does not place much emphasis on likability, appearance or formal business training, although general education can have a significant impact.

The executive credited his rank to hard work tempered by ambition and luck and named integrity as the most important ingredient of a successful business career.

Younger execs more mobile

He said he has worked for only two companies and has been with his present firm for 17 years, although younger respondents showed more mobility.

His ambition is to become chief executive officer of his company — not to own his own business. He said that if he were financially independent, he would continue to work at his present position.

The executive is in general management, after starting his career in finance or accounting.

Fast track

However, he said he believes sales and marketing is currently the fastest route to the top in his organization and will remain so in 10 years.

The executive's average workweek is 56 hours. He said he spends about 49 days a year traveling on business and takes 14 vacation days a year. He fully intends to retire at or before age 65.

He said he feels the biggest threat to his career is a corporate reorganization.

At 3 a.m. on November
declared at our cor

Richard Kielowski
Vice President,
Information Services
Denny's Inc.

"I declared a full-scale mock disaster in our Denny's Inc. data center to ensure our ability to provide the highest level of protection for vital assets and uninterrupted service to our guests."

Here are a few of the facts:

- To ensure the seriousness and realism of the recovery activity, there was no preannouncement of the "disaster."
- Beyond our concerns with shelf life and food preparation, Denny's is a perishable business in the sense that a missed meal is a lost sale. There are no next-day chances to recoup it.
- Rapid inventory turnover demands that our supply lines remain clear at all times. These supply lines are critically dependent on on-line order entry processing.
- Denny's is an enterprise that deals with high volumes and moderate prices.
- Denny's operates on a weekly basis. In addition to daily polling of each restaurant to collect financial data, we issue weekly paychecks to 50,000 employees, and each of our 1,200 restaurant managers receives a weekly profit/loss statement.
- To protect our operating capabilities, Denny's Inc. management is committed to total redundancy in our data processing operations.

With over 1.3 Billion in total sales, our 1,200 Denny's restaurants play a major role in the success of the corporation. My primary concern is the success of the company's management objectives. Denny's restaurant operation is time-sensitive, labor-intensive, vertically integrated and exceptionally committed to an on-line environment. As a result, we take the issue of disaster recovery very seriously, gearing ourselves, from the top down, to the protection of the data processing resource.

Denny's Inc. corporate data center:

- processes over $20,000 in food and beverage sales weekly for each of our 1,200 restaurants.
- electronically captures payroll, cash and menu mix information from each of our 1,200 Denny's restaurants weekly.
- processes over 70,000 deposit transactions daily
- handles payroll and benefit transactions weekly for over 50,000 employees nationwide.

Every week, trucks from the Denny's Inc. subsidiary, Proficient Food Company, deliver average food orders of over $5,000 to each of 1,200 Denny's Restaurants nationwide. All ordering and distribution is processed on-line through Denny's corporate data facility

Evan Wride
Director,
Systems Development
Denny's Inc.

"After receiving Rich's directive, I made a surprise phone call to the Data Center Manager at his home in California. It set in motion a series of critical events that tested our ability to provide 24-hour, 7-days-a-week processing to the Denny's user community."

Here are a few of the facts:

- Denny's joined the on-line environment in 1981 and developed a disaster recovery plan in 1982. We routinely test twice annually at our hot site facility.
- Our objective was to bring up the operating system and critical applications at the disaster recovery facility within 24 hours of a disaster.
- We wanted to test our recovery plan and the ability of our personnel to move quickly to the critical path of our recovery effort.
- Within four hours, three disaster recovery teams had been dispatched and were enroute to two destinations with their responsibilities firmly in hand.

Our ability to provide continuous data processing demands broad redundancy throughout the data center. That is in place. But Denny's Inc. is committed to *maximum* management of the risks of a computer disaster. For us, hot site backup is just another level of redundancy beyond the data center — another important layer of protection for our business.

19, 1985, a disaster was
porate data center.

In one year, Denny's 1,200 restaurants serve more than 90 million breakfasts to the American public. That requires ordering, procurement, delivery and preparation of approximately:

- 7.5 million lbs. of coffee
- 264 million eggs
- 7 million loaves of bread
- 21 million lbs. of bacon and sausage
- 10 million lbs. of pancake mix
- 2 million gallons of milk

Shepard James
Data Center Manager
Denny's Inc.

"When I received Evan's call at 3 a.m., I first picked myself up off the floor. Then I immediately put in action our disaster recovery plan."

Here are a few of the facts:

- We had planned, strategized and tested. Now it was time to find out how effective we could be in the face of an unexpected shutdown.
- It was my responsibility to alert and dispatch our personnel with specific directives that would allow us to bring up the operating system and critical applications at the Recovery Center within 24 hours of the "disaster."
- Reestablishing user access was critical, since 1,200 restaurants were depending on us to keep them functioning.
- Along with general operating concerns, we were specifically interested in our ability to back up our communications network at the Recovery Center.

Once we had established the critical path and our teams had arrived at the Recovery Center, we were able to bring up the MVS operating system, run diagnostics on our communications equipment, and begin processing critical applications according to schedule. We knew we were well prepared, but nothing validated our ability to respond as well as the real-world dynamics of this experience.

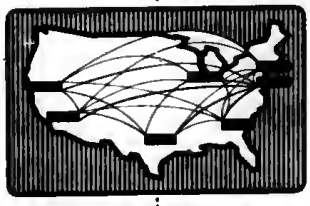
"Within 22 hours of declaring the "disaster," our operating system was up and running, thanks to proper planning and a capable disaster recovery resource like CDRS. We met our objectives and honed the capability of our seasoned disaster recovery team."

Richard Kalowski
Vice President,
Information Services
Denny's Inc.

- Through this experience, we reaffirmed our ability to conduct business under potentially disastrous circumstances.
- Sound recovery procedures are especially important to our division operating people, who truly recognize the importance of protecting the data processing resource.
- Denny's has tested its plan six times in the past three years. As a result of that, we have come to believe that testing is as important as planning. Every time we test, we flush out a new wrinkle.
- Denny's Inc. has committed the resources to ensure that we don't lose a single breakfast transaction. That may appear simplistic, but when you consider what's at stake, disaster recovery simply makes good business sense.

Denny's Inc. is one of the more than 625 corporations for whom Comdisco Disaster Recovery Services, Inc. provides disaster recovery services. Their experience and concern is similar to that of many companies seeking bottom-line assurance through a dependable contingency resource. CDRS is pleased to be able to share their story.

To receive literature on CDRS services, clip and mail coupon, or CALL TOLL FREE 1-800-922-0231
(In N.J. Call 1-201-896-9500)



Yes, CDRS! Please send me more information on your disaster recovery services.

Name _____

Company _____ Title _____

Address _____ Phone _____

City _____ State _____ Zip _____

Clip and return coupon to: Richard Zane, Senior Vice President, Sales and Marketing, Comdisco Disaster Recovery Services, Inc., 430 Gotham Parkway, Carlstadt, NJ 07072

COMDISCO®
Comdisco Disaster Recovery Services, Inc.

MANAGEMENT

Your style as manager

From page 51

ment team, trusting his management proficiency and hard work would promote his success. Unfortunately, he never saw that his style was contrary to the relaxed, sociable attitude of top management. Key discussions often took place over long lunches and decisions were made on the golf course or while socializing. Though the data processing manager was a peer on the organizational chart, he did not belong to the team responsible for running the company, largely due to a difference in style.

It should be noted, however, that when two opposite types can coexist the complementary strength can be great. Traditional examples are the thinker and the doer, word people and numbers people, people-oriented individuals and task-oriented ones. In a hiring situation, while we may be drawn to people like ourselves, it may be someone very different who would make for the best working team by complementing our abilities.

Personality and style affect not only our ability to get along with others but the very ability to perform certain tasks. This is seen best in the context of changing job needs. Several large data processing shops owe their success to managers who charted the shops' growth and inspired people to implement a vision.

When their companies' fortunes changed, however, and the task became one of caretaking, the drive to alter and improve was not consistent with the new need to control and fine-tune. The introduction of distributed processing and personal computers has had the same impact on control-oriented managers. Some who could not tolerate a more cooperative style appeared to be technically obsolete when, in fact, the problem was really an inflexible personality trait.

Understanding yourself

With so many ways in which your style can work for or against you, it is important that you understand yourself. You can gain insight by asking yourself which tasks you like and do well and which you do not. Is there a pattern to your successes and disappointments? What people do you like and get along with and why?

The most dramatic use of personal skill assessment is when it leads to the need for staff changes. You may conclude that a subordinate just cannot work with you or that you cannot work for a certain company. However, that should be rare. Remember, all differences in personality are not bad — only those that lead to conflict and inefficiency.

For example, if a manager recognizes that a particular task requires a creative orientation that is not his strength, he may choose to delegate the task to someone with that trait or at least work with such a person.

In supervising others, a data processing manager may be concerned about subordinates who spend much of their day socializing. However, it may be that this is not only important to the employees but to how they get work done. If this is only in conflict with the manager's ideas about proper work, perhaps an objective yardstick can be established to ensure that the important things are getting done.

However, if the behavior is contrary to the beliefs of top management, co-workers, customers or others, then no yardstick will be able to measure the potential disruption. Clearly, the only remedy is action such as closer supervision, environmental change or job reassignment.

The essential thing to remember is that data processing and personality are not contradictory terms. Computer management and personal style are not mutually exclusive. Even though we work in a world noted for precision and scientific method, it is ultimately people who make it work. Therefore people are the most important thing to understand — beginning with ourselves.

We knew 25 years ago there would be changes.

Like most, we started out small.

But we planned for changes. And grew fast.

Today, Leasametric is your single-source supplier for every data communications need. And the most stable company in the business.

You'll find brand name PCs, terminals, printers, modems, multiplexers, local area networking capabilities, everything.

Soon, even high-end micro computers. Systems integration. And value-added offerings.

Which gives us the industry's most comprehensive inventory.

And, at Leasametric, you can rent or lease, with finance plans that fit your tax plans. Like long- and short-term rentals. And fair-market-value and finance leases. Or you can buy equipment, both new and used.

You get a complete range of services, too. Including on-site maintenance, return-to-depot programs, time and materials, and more.

So for data communications, think Leasametric. Your single-source supplier.

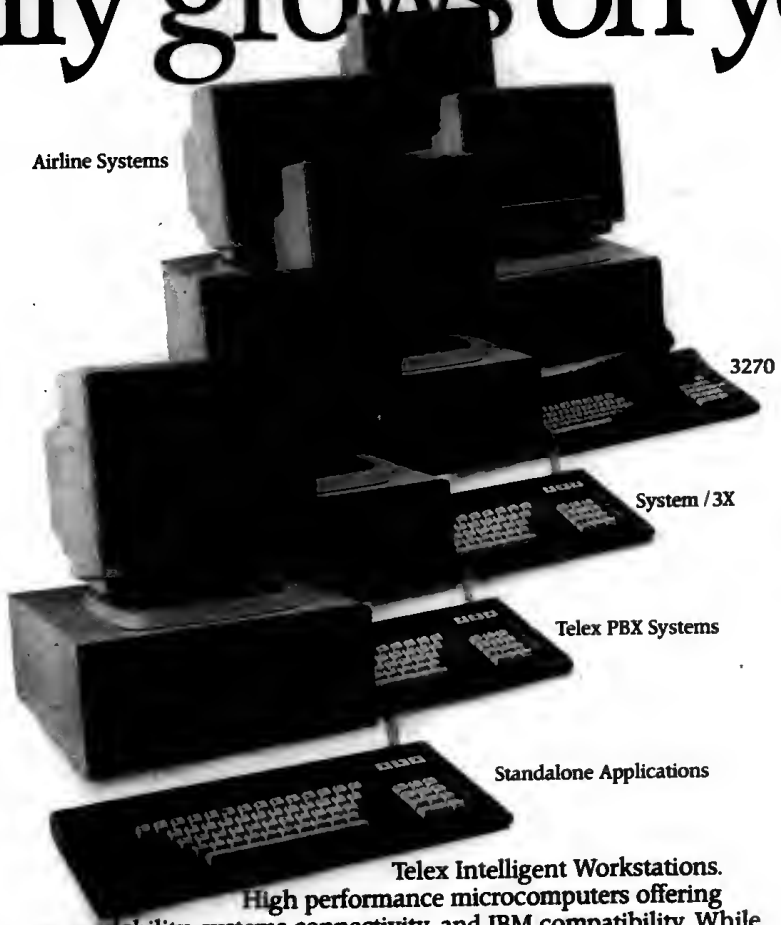
And the only 25 year old in the business.

LEASAMETRIC
Data Communications Division

All the equipment. All the service. All the time.

Northern California & Pacific Northwest 415-574-5797 • Southern California 1-800-638-8570
Rocky Mountains 1-800-638-7854 • Southeast 1-800-241-5841 • Central 1-800-323-4823 • Northeast 1-800-221-0246

Intelligence that easily grows on you.



Telex Intelligent Workstations. High performance microcomputers offering expandability, systems connectivity, and IBM compatibility. While they've become the standard for 3270 subsystem intelligence, that's just the beginning of where they can grow. Because now they're expandable into airline, S/3X, and PBX environments.

Whatever information worlds you are merging, let Telex Intelligent Workstations connect you to the future, today. For more information on Telex products and worldwide service and support call Telex. USA: 1-800-331-2623, Ext. 3284 (Oklahoma, 1-918-628-3284). INTERNATIONAL: 1-617-769-8000. CANADA: 1-800-268-3233. EUROPE: 41-38-22-6101.

The #1
3270 Alternative.

TELEX.

TELEX COMPUTER PRODUCTS, INC.

IBM is a registered trademark of International Business Machines Corporation.
Telex is a registered trademark of The Telex Corporation.

Taking care of business

From page 51

vice-president for corporate operations.

Cross's responsibilities range from telecommunications to decision-support systems, with the major resource being a 12,000-node network that links nearly 60,000 employees through electronic mail and various applications.

He also chairs a corporate information systems management committee made up of information systems subordinates, local information systems site managers and senior executives from various geographical and functional areas.

The committee directs corporate information systems planning and budgeting while trying to maintain what Cross calls strong reporting relationships within the operating units.

Cross speaks of accomplishments in his current role strictly in terms of benefits to DEC's manufacturing and marketing activities. Improvements in managing materials increased the number of times inventory is turned over per year from 1.8 to more than three. Enhancements in managing orders cut the time between placement and confirmation by more than half.

Using artificial intelligence to configure complex orders reduced the number that are changed, which cut costs and enhanced customer satisfaction.

Cross says he believes his move from line management to corporate information systems — with its responsibility across the entire corporation — enhances his career prospects at DEC.

"I get a very cross-organizational perspective about how the business works," he says. "Some of the metrics we use to measure ourselves are what's happening with inventory turns, what's happening with accounts receivable, what's happening with the company's overall asset management."

Cross recommends that other line managers work in information systems to broaden their perspectives and that information systems managers likewise work in line positions, even moving from one function to another, which he says is increasingly possible with the decentralization of processing.

Cross also suggests that information system managers trying to acquire general business knowledge take courses in areas such as management and finance. "It's appropriate to get some good old-fashioned education to any extent that's possible," he says.

Boston users enlightened

From page 51

ing was closed, although workers were allowed to retrieve items they needed.

While most businesses had to operate out of other branches or share facilities with beneficent companies, one firm, Putnam Cos., a pension and mutual fund manager, moved to a prearranged disaster-recovery hot site.

Putnam Investor Services, Inc. — a subsidiary of the $34 billion Putnam Cos. — protected its securities trading by retrieving up-to-date backup data from an off-site vault and rushing it to a Sungard Data Systems, Inc. hot site in Philadelphia. For the next week, Putnam ran its IBM 4381 operations at the hot site through its Quincy, Mass., branch.

Putnam had grown big enough five years ago for its managers to provide for disaster recovery for the home office, but no such safeguards had been arranged for some smaller offices in the building, prompting managers there to consider the risks they face.

On the five floors of offices of the accounting and consulting firm Coopers & Lybrand, there was smoke damage but no loss of equipment or data, according to Barry Davis, microcomput-

MANAGEMENT
REPORTING/RETRIEVAL
CAPABILITY
for THE IBM S/38
For more information
Contact Charles White at
michaels, ross & cole, ltd.
800 West Roosevelt Road
Building E, Suite 304
Glen Ellyn, IL 60137
(312) 790-5040

ing facilities coordinator. But had the fire actually entered the offices, the firm would have lost all the disks for roughly 65 microcomputers, which are used primarily for client work — audits, analysis of audits and spreadsheet applications.

Coopers & Lybrand stores hard copy and tapes from its Digital Equipment Corp. VAX minicomputer off-site but does not have remote storage for backup diskettes, Davis says. The firm has insurance for the equipment and could reorder the software, but any data on disks would have been lost.

Backup advice

"If you can store diskettes, store them in cases and cabinets so the sprinklers won't ruin them, at the very least," Davis advises. "You should have them backed up off-site, but it's one thing to say that and quite another to get it done."

Davis says he finds that even getting PC users to make a duplicate copy is difficult. "If somebody spends two to three days working up something on Lotus Development Corp. 1-2-3 and the disk goes, it is their responsibility," he says.

At Craig & Mac Cauley Professional Corp., a law firm on One Post Office Square's 22nd floor, occasional shutoffs of electricity at the building had made Pauline Hanson wary. As the assistant administrator of a Wang Laboratories, Inc. VS15 word processing installation, Hanson had decided on the Sunday before the fire to keep everything backed up in an on-site vault.

After the fire, workers were able to retrieve stored backup from their offices and continue working at another law firm with a bigger Wang system. "If we weren't allowed back into the building, there would have been nothing we could possibly do," Hanson says.

She has made a disaster recovery plan a priority for the near future. Her firm is moving to another building and, as soon as it is settled, she hopes to convince executives to cover themselves against loss. "We use the Wang to do briefs, litigation, wills and trusts. If they were destroyed, we would be in serious trouble," Hanson adds.

Disaster planning should be senior management's charge, according to a recent report by the National Bureau of Standards. "Senior management must take responsiblity for the planning, funding, implementation, testing and certification of an alternate processing strategy," the report says.

Assigning responsibility

Top executives should assign management responsiblities for developing alternate processing strategies, demonstrate a dedication to developing and supporting the plan, commit the necessary resources, monitor development and require and verify periodic testing of the strategy, the report adds.

Alternative strategies can range from enrollment in dedicated disaster recovery centers or shared contingeny centers at the top end to a reversion to manual processing as the last resort. An individual company's risk assessment efforts will show what level of coverage is necessary.

Reverting to manual processing is not a likely alternative for any large or medium-size company, Hoey notes. "In most cases, the people who know how to do that are retired or dead. The company wouldn't have a mainframe if it were possible to do it manually."

SOFTWARE CONVERSION SOLUTIONS

Dataware provides the software translation system for your complex conversion problems. Over 18 years of conversion experience has resulted in thousands of satisfied customers worldwide

- COBOL to COBOL
- AUTOCODER / SPS to COBOL
- EASYCODER / TRAN to COBOL
- BAL / ALC to COBOL
- FORTRAN to FORTRAN
- PL/1 to COBOL
- RPG / RPG II to COBOL
- RPG / RPG II to PL/1
- DOS to MVS

Dataware offers services & software to meet your needs. For more information call or write today

The Conversion Software People

dataware, inc.

A Computer Task Group Company

3005 Union Road
Orchard Park, NY 14127-1214
Phone: (800) 267-3887
TELEX: 910-160-2155

It's OK, you're OK. Thanks to Sorbus.®

Small computer problems can turn into big business troubles–whether you're running an IBM® Series I, System/34, System/36 or 36PC, or System/38. Or an MAI Basic Four® mini, for that matter.

Fortunately, there's Sorbus preventive maintenance. To fight downtime–and to keep you in business, by keeping your computer in business.

And if something *does* go wrong, we fix it fast. Thanks to our two-hour average response time. Our 230,000 part-number inventory. Our 1½ hour average repair time. And our single-source responsibility for more than 3,000 different kinds of computer equipment.

All of which have made us a leading independent computer maintenance company, servicing more IBMs–from micros to mainframes–than anyone else. Except IBM. But we're working on it.

Keep your minicomputer well-adjusted.
Call Sorbus today. **1-800-FOR-INFO.**

Sorbus®
A Bell Atlantic™ Company

50 E. Swedesford Road
Frazer, PA 19355

IBM is a registered trademark of International Business Machines, Inc.
Basic Four is a registered trademark of MAI Basic Four.

NEW PRODUCTS

PC network tool compatible with Netbios

Server Technology, Inc. in Sunnyvale, Calif., has announced Easylan Version 3.0, an IBM Netbios-compatible version of its personal computer network software.

Easylan 3.0 is said to allow personal computer users to run application programs written to IBM's network interface standard over RS-232C serial communications links and to develop Netbios-compatible local-area network (LAN) applications.

According to a company spokesman, Easylan 3.0 interconnects up to 20 IBM Personal Computers, PC XTs, ATs or compatibles.

The Netbios interface defines four basic network functions — send, receive, connect and disconnect. Because Server Technology has implemented Netbios through software and the PC's RS-232C serial communications ports, a network program coded to use the Netbios 5C interrupt will operate with IBM's PC Network, the IBM Token-Ring network and other LANs that support the Netbios interface, the spokesman added.

Easylan Version 3.0 also incorporates four new network commands in addition to the DOS-like EZDIR, EZCOPY, EZTYPE, EZDELETE and EZRENAME. The commands are EZCLOCK, for setting the network time from one date and time board; EZBEEP, for signaling other users through the PC's speaker when a file is about to be transferred or when a file transfer is complete; and EZMD and EZRD, allowing one user to make or delete subdirectories on another interconnected PC.

Easylan Version 3.0 supports commonly used single-user programs such as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase products.

The single-copy price is $99.95. A two-PC kit is priced at $219.95. Additional single-user add-ons cost $119.95. Existing users of previous versions can upgrade to Version 3.0 for $25, the vendor said.

Screen painting facility debuts

Designs and manages CICS screens on micros

Micromain Software, Inc. in Duxbury, Mass., has announced an IBM CICS screen painting and design facility for the IBM Personal Computer.

Called Micromain Painter, the software has the ability to build maps and create IBM's Basic Mapping Support (BMS) code on the PC for use in mainframe CICS applications, according to the vendor.

Micromain Painter is said to be a fully operational, menu-driven mainframe-style utility for designing and managing screens.

Multiple utilities

The product incorporates utilities for handling, listing and testing files that contain screen designs and generated BMS code.

According to the vendor, the product features the ability to design CICS mainframe screens on IBM PCs or compatibles. It is also said to be able to store, modify, save design and generate the BMS code for use in the mainframe applications.

Extended attributes

The BMS code includes extended attributes, color and multiple-map mapsets. The BMS source code is uploaded for a PC file for use in the CICS application, the vendor said.

Micromain Painter also features an import facility to accept screen designs from other sources such as word processing systems and an export facility to include screen images in documentation.

Micromain Painter costs $495, the vendor said.

Technical publisher upgrade handles complex documents

Interleaf, Inc. in Cambridge, Mass., has announced the first customer shipments of its Technical Publishing Software (TPS) Release 3.0.

According to a company spokesman, TPS used to be primarily an office automation product. On the other hand, the spokesman continued, Release 3.0 focuses on productivity enhancements for users who create long, complex documents such as technical manuals, directories and books.

Features of Release 3.0 include editing and formatting control of text within graphics; revision tracking; an equation package; and a book facility for long-document assembly, including automatic numbering and cross-referencing.

This numbering and cross-referencing feature also has the ability to automatically generate an index and a table of contents, according to the vendor.

Other features of Release 3.0 are said to include additional computer-aided design interfaces, isometric and freehand drawing, additional graphics input options including line-art scanner and tracing tablet, enhanced software for editing images and new typefaces.

Can be bundled with workstations

TPS Release 3.0 is available bundled with 32-bit workstations manufactured by Apollo Computer, Inc., Digital Equipment Corp. and Sun Microsystems, Inc., according to the vendor.

An entry-level configuration including Apollo, DEC or Sun workstation, standard TPS software license and an Interleaf laser printer is priced at $29,900.

Unbundled TPS costs $15,000 per license, the vendor said.

INSIDE

Software & Services/61
Microcomputing/61
Networking/61
Systems & Peripherals/62
Price Reductions/62

Server ups Unix users' speed

Informix Software, Inc., based in Menlo Park, Calif., has announced the release of Informix-Turbo, a specialized data base server said to increase transaction processing speed and provide fault tolerance.

According to a company spokesman, Informix-Turbo was designed to provide Unix-based system users with the ability to handle heavy on-line transaction processing without increasing the risk of information loss.

Informix-Turbo is an optional data base server that uses AT&T Unix System V shared memory, query optimization techniques and raw I/O capability to manage data and speed access for users. A system administrator can use expert-system technology to modify parameters that affect the performance of the system for a particular application environment.

To implement fault tolerance, Informix-Turbo bypasses Unix to insert, read and update data directly on the disk rather than buffering the information in internal memory and writing it onto the disk later. The server keeps transaction logs of the writes so that if there is a system failure, it can use its logs to restore the data base to the last transaction processed. The logs also enable Informix-Turbo to maintain data consistency across multiple tables.

Informix-Turbo is priced from $1,200. It requires Unix System V shared memory and, because it is a data base server, must be used with another Informix product or application as a front end.

According to the company, all current applications written with Informix-4GL, Informix-SQL and other Informix products can be used with Informix-Turbo.

Informix-Turbo will be available in March.

Prime unveils Common LISP

Language integrates with system software

Prime Computer, Inc. of Natick, Mass., has announced the availability of the company's proprietary implementation of the industry standard Common LISP programming language for Prime general-purpose superminicomputers.

Called Prime Common LISP, the programming language is said to be fully integrated with Prime system software. According to the vendor, users can develop and execute artificial intelligence and symbolic computing applications on 50 series systems, such as portfolio management, environmental quality control, mining and exploration strategies, numerical control tooling and flexible manufacturing systems.

In the stand-alone development environment, Prime Common LISP users can develop, compile and debug LISP programs interactively. With the runtime system, users can execute applications independently of the development environment.

Prime Common LISP interfaces to Prime languages, the Primos operating system and other Prime system utilities. Users can exchange data between application programs and incorporate existing data bases into their LISP programs.

Prime Common LISP is user installable. It requires Revision 20.0 of Primos. For Prime office systems, the development environment costs $8,400; for $10,500, it comes packaged with the Emacs full-screen text editor. For computer-room systems, the development environment is priced at $12,000 and at $16,000 with Emacs. The Prime Common LISP runtime system costs $4,000 for all Prime systems.

PEOPLE BUY MORE OF THESE...

THAN ALL OF THESE COMBINED.

It's no wonder more people rely on BASF. We've spent more time making our media more reliable.

Twenty years ago, BASF began its pioneering work in the Chromium Dioxide (CrO_2) particle technology that makes the 3480 tape possible. When the 3480 drive was perfected in 1985, we not only had plenty of experience with the medium, we were the world's largest producer of CrO_2 particles. And not surprisingly, every one of the four million BASF 3480-compatible cartridges we've sold meets or exceeds IBM and ANSI standards. We're so confident in the superior performance and reliability of our cartridge that we back it with a 10-year warranty. Check it out for yourself. The BASF 3480-compatible cartridge...the one you can count on. Available in quantity for immediate delivery. Call 1-800-343-4600.

BASF Corporation Information Systems
Crosby Drive, Bedford, MA 01730-1471

BASF

Computer Tape and Cartridges · Floppy Disks · Rigid Disk Media

SOFTWARE & SERVICES

Systems software

Cambridge Systems Group has introduced **ACF2/VM Release 3.0**, an enhanced version of its data security software for VM users.

Release 3.0 is said to provide enhanced security for the CP DIAL command, allowing a virtual machine to be secure from unauthorized DIAL access. Under Release 3.0, the installation has the option to validate logons of FORCEID users and write individual rule sets for each DIAGNOSE instruction controlled by ACF2/VM.

ACF2/VM Release 3.0 does not require source code modification for VM Control Program modules.

ACF2/VM Release 3.0 costs $24,000. Current users may upgrade for free.

Cambridge Systems Group, 1333 Lawrence Expwy., Santa Clara, Calif. 95051.

Applications packages

SCS, Inc. has announced an IBM Manufacturing, Accounting and Production Information Control System-interfaced **quote-estimating system**.

The system allows users to determine final price estimates using any cost variables specific to their business and to print quotes that can be sent to customers and maintain a quote history. It also provides a Help text for on-line documentation.

The quote-estimating system costs $3,200.

SCS, Suite 300, 201 S. Main St., N. Syracuse, N.Y. 13212.

Software languages

Celerity Computing has announced the availability of the **LISP** artificial intelligence programming language for its Unix-based 32-bit computer systems.

The Franz LISP dialect offered allows multiple users to run large-scale AI applications, such as the Department of Energy MACSYMA. Celerity's LISP has been optimized to take advantage of the University of California at Berkeley Unix version operating system.

Celerity's Lisp costs $7,000.

Celerity Computing, 9692 Via Excelencia, San Diego, Calif. 92126.

MICROCOMPUTING

Software enhancements

Kartech Data Services, Inc. has announced **Release 1.8** of its **PC-Proto**, a systems prototyping tool.

PC-Proto allows users to create a working model of a system on an IBM Personal Computer, PC XT, AT or compatible. It also provides access to files and data bases and features include enhanced cross-reference reports and an enhanced file converter.

PC-Proto costs $249.

Kartech Data Services, 165 Pinewood Ave., Toronto, Ont., Canada M6C 2V6.

Communications

Consumers Software, Inc. has announced an entry-level version of its **Network Courier** electronic-mail program for personal computer local-area networks.

The program was designed for networks with up to six personal computers. It provides the same functionality of the standard version and the ability to share files without exiting application programs.

The entry-level version of Network Courier is priced at $295.

Consumers Software, Suite A, 8315 Monterey St., Gilroy, Calif. 95020.

Data storage

CMS, Inc. has announced the **K-Kit 60**, a 60M-byte hard disk drive subsystem for the IBM Personal Computer XT.

The drive features an average access time of 28 ms., a transfer rate of 5M bit/sec. and required operating power of 29 watts.

The subsystem comes formatted for installation and includes controller card, cables and mounting hardware.

The K-Kit 60 costs $1,595.

CMS, 3080 Airway Ave., Costa Mesa, Calif. 92626.

NETWORKING

Protocol converters

Datagraf, Inc. has announced the **Honeywell VIP 7700** and **VIP 7800 protocol converters**.

The protocol conversion packages are said to convert terminal protocols of other manufacturers, such as IBM, Burroughs Corp. and Sperry Corp., to emulations of the Honeywell, Inc. terminal protocols. It is said to allow for communications with Honeywell mainframes as well as associated front-end processors.

The Honeywell conversion packages are available in Series II and Bump protocol converter configurations. Prices start at $3,300.

Datagraf, 8305 Highway 71 W., Austin, Texas 78735.

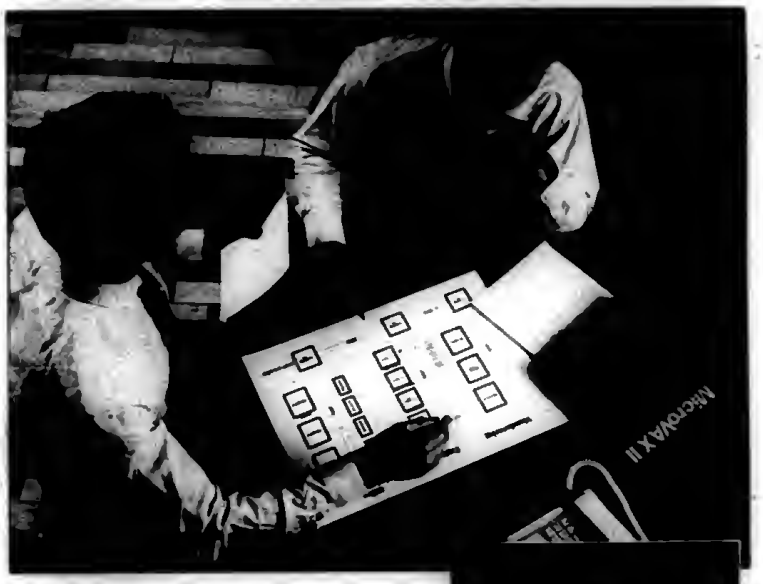
Software

Communications Research Group has announced **Blast Host**, a software product designed to allow mini or personal computers to connect to mainframes.

Blast Host runs under IBM's VM/CMS and MVS/TSO operating systems using any asynchronous pathways found in the mainframe environment, such as protocol converters and CCITT X.25 pads. It operates as an application program to connect

Continued on page 62

Buy Digital's MicroVAX II from MTI and get more than a powerful cpu...



Get MTI Technical Expertise. Digital's MicroVAX II is a powerful, 32-bit, cost effective microcomputer configured with the extended Q-bus. Software compatible with larger VAX systems, the MicroVAX II can operate in any normal office environment with a standard 15 amp outlet.

MTI has been an authorized Digital distributor for over ten years and has a staff of Digital-trained applications engineers ready to help you find the best combination of Digital products to get the most out of the MicroVAX II. Buy, lease, or rent it at great prices. Call MTI today.

THE MICROVAX II FAMILY

MTI SYSTEMS CORP.
A SUBSIDIARY OF DUCOMMUN INCORPORATED
Computer & Data Communications Equipment
Sales / Leasing / Service / Systems Integration

New York: 212/226-2337, 516/621-6200, 518/449-5959
New Jersey: 201/227-5552
Ohio: 216/464-6688

MicroVAX is a trademark of Digital Equipment Corporation

Authorized Distributor

Continued from page 61

PCs or minis to a remote host and transfer files between systems.

Features include IBM 3270 terminal emulation, asynchronous connectivity and automatic connection to host mainframes or minis dialing public-network pads.

Blast Host is priced at $5,500.

Communications Research Group, Third Floor, 5616 Corporate Blvd., Baton Rouge, La. 70808.

Multiplexers/Modems

Franklin Telecom has introduced the **FM-2400E** and the **Bright modems**.

Both are said to be Hayes Microcomputer Products, Inc.-compatible. The FM-2400E operates at 24K bit/sec. It offers asynchronous or synchronous transmission.

The Bright modem is a full-function modem that fits into the short slots of the IBM Personal Computer and compatibles. It operates at 12K bit/sec. and has auto-answer, pulse or touch tone auto-dial, automatic speed selection and switch-selectable settings for COM1/COM2 ports.

The FM-2400E costs $460. The Bright modem costs $149.

Franklin Telecom, 31320 Via Colinas #113, Westlake Village, Calif. 91362.

SYSTEMS & PERIPHERALS

Turnkey systems

General Computer Corp. has introduced the **Script Manager II**, a stand-alone system designed for use in pharmacies.

The Script Manager II features computer assistance in filling and refilling prescriptions; third-party billing through the vendor's central billing service or through roster billing; monitoring for allergic reactions as well as for conditions against the medications being dispensed; patient profiles; itemized formulary; reordering; and reporting tools, according to the vendor.

The Script Manager II is available for lease for $259 for 60 months or $299 for 48 months.

General Computer, 2045 Midway Drive, Twinsburg, Ohio 44087.

Processors

Imaging Technology, Inc. has added the **HF-150 Histogram/Feature Extractor** to its Series 150 and 151 product lines.

The HF-150 is a Motorola, Inc. VMEbus-compatible, dual-function board said to perform both histogramming and feature extraction at real-time video rates. Features include the ability to accelerate the execution of image processing functions.

The coordinates of up to 16 features can be recorded simultaneously. The output buffer can hold up to 16,000 distinct features.

Histograms are performed on 10-bit image data.

The HF-150 with one output buffer costs $2,395; with two it costs $2,895.

Imaging Technology, 600 W. Cummings Park, Woburn, Mass. 01801.

Terminals

Informer Computer Terminals has announced its **207-102** portable workstation.

The 207-102 is said to connect a Digital Equipment Corp. communications network to an IBM communications network through a protocol converter. It is said to be functionally equivalent to DEC's VT102 display terminal. It features direct RS-232C connection or an optional dial-up connection to the mainframe.

The unit features a 9-in. display with a flip-down keyboard; switching between 80 and 132 columns; and an external asychronous ASCII printer port.

The basic Informer 207-102 costs $1,390.

Informer Computer Terminals, 12781 Pala Drive, Garden Grove, Calif. 92641.

Printers/Plotters

Wespercorp, Inc.'s Western Peripherals Group has introduced the **DLP-3000** printer protocol converter said to support Hewlett-Packard Co. HP300 minicomputers.

According to the vendor, the DLP-3000 provides a standard RS-232 serial connection on the printer side while returning emulation of the HP 2631B or 2930 series printers to the host.

The device's HP emulation also supports the HP 3000 MPE spooler for remote-spool printing. It also works with parallel-to-serial converters.

Other attributes of the printer protocol converter include built-in diagnostics and error detection and correction of print files.

The DLP-3000 is priced at $900.

Wespercorp, 1821 E. Dyer Road, Santa Ana, Calif. 92705.

PRICE REDUCTIONS

Ampex Corp. has reduced the price of its **Ampex 220** video display terminal.

The Ampex 220 is an American National Standards Institute terminal said to be compatible with Digital Equipment Corp. VT220, VT102, VT100 and VT52 protocols. It features 400 bytes of nonvolatile programmable function-key memory, a programmable user line, function key loading, VT220-compatible keyboard, downloadable character sets, block mode and a Compose character key.

The Ampex 220 is now priced at $529.

Ampex, 401 Broadway, Redwood City, Calif. 94063.

WALKER HELPS KEEP THE PEACE AT PENNSYLVANIA GAS AND WATER

"While many packages satisfy user requirements, Walker also satisfies data processing objectives. Eliminating conversions each time our computer environment changes gives us a competitive advantage."

David A. Miller
Director of Data Processing
Pennsylvania Gas and Water (PG&W)

Data Processing Director David Miller maintains a peaceful coexistence between users and data processing personnel at Pennsylvania's $230 million utility by training both groups in Walker's financial application packages.

"We solved two distinct sets of requirements, without making tradeoffs," says Miller.

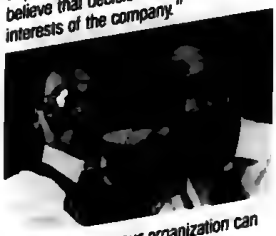
USER NEEDS: "It was important that users begin to control the systems supporting their business activities," explains Miller. "With Walker products, users work with high level tools to interactively tailor screens and reports to match PG&W's business requirements. Once the application is installed, users control the majority of the application's processing," says Miller.

DP NEEDS: Experience told Miller that hardware and software changes were inevitable: "In the '70s we experienced numerous changes in the company's operating environment," he says. "We were determined to minimize the future effects of such changes by making prudent hardware decisions and by isolating application software."

Miller achieved his goals. Because Walker products run independently of operating, data base management, and telecommunications systems. Notes Miller: "We no longer perform costly conversions for our Walker-based products each time components in our operating environment change."

During the selection process, Miller looked beyond current package pricing. "We factored into product cost the expense associated with the total conversions expected over its useful life," says Miller. "We believe this type of evaluation presents a more valid view of an application's cost."

"Every time we review our decision to purchase Walker products, we still believe that decision was in the best interests of the company."



Find out how your organization can keep the peace. Call or return the coupon below.

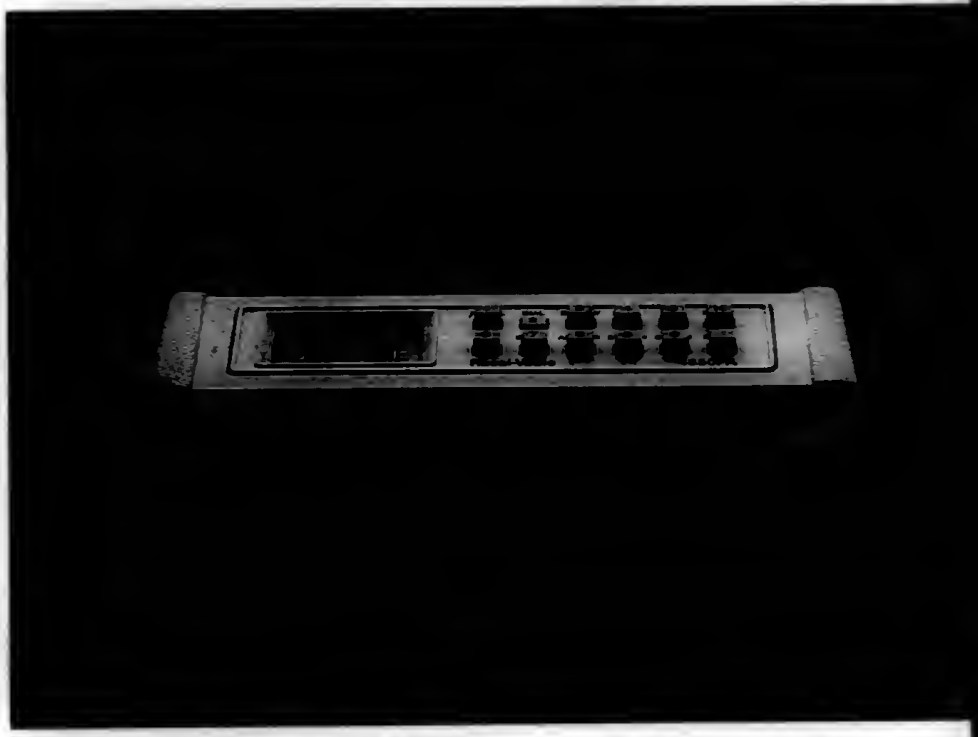
☐ Please contact me for a demonstration.
☐ Please send literature describing your family of products.

Name
Title
Company
Phone
City Zip
State
IBM Mainframe DBMS
Oper. System

WALKER

Walker Interactive Products
100 Spear Street, Suite 300
San Francisco, California 94105
(415) 495-8811

The Ideal Sync For Your Mainframe Lynk.



Now you can autodial from any remote site, in any sync protocol, with Racal-Vadic's new 4850 PA modem.

Set your remote sites on the most capable 4800 bps dial-up sync modem ever made.

The new 4850PA, from Racal-Vadic.

No other 4800 bps dial-up modem makes more sync connections, more ways, more automatically. With a 4850PA, you get both 208B and V.27 *ter* compatibility. You also get BSC, SNA/SDLC and HDLC serial autodialers, plus an 801 parallel autodialer. You can even upgrade it to 9600 bps. Which means the 4850PA can sync up with just about everything.

The 4850PA is extremely compact, fully automatic and packed with useful features. The front-panel keyboard comes with an LCD display, and lets you program up to 28 options, including storage for 15 phone numbers.

And since it's a sync modem, the 4850PA is the ideal companion for every kind of remote device, including RJEs and PCs in micro-to-mainframe applications. You can even use it to lynk up your minis.

So get *all* your remote sites in sync with your mainframe. Dial up Racal-Vadic today at **800-482-3427** and ask for more information about the 4850PA.

RACAL
The Electronics Group

Racal-Vadic

1525 McCarthy Boulevard, Milpitas, CA 95035
Tel: (408) 946-2227 • TWX: 556-409 RAVA MLP

You don't get milestones ahead...

© 1987 Novell, Inc., World Headquarters, 122 East 1700 South, Provo, Utah 84601 (801) 379-5900
IBM is a registered trademark of International Business Machines Corporation

by resting on what's behind.

Somewhere along the way, a leader has to break away from the pack. And go it alone. That's what leadership is all about. Standing up, bearing down, and moving ahead.

Breaking Away.

Novell broke out of the local area networking (LAN) pack four years ago with the introduction of the file server. We called it a LAN milestone. Others scoffed. Three years later, when IBM announced that its LAN systems would be file server-based, the rest of the pack finally headed for that first milestone.

But Novell was already milestones ahead. By porting the NetWare® LAN Operating System to over 30 major LAN hardware systems and offering nearly 4,000 NetWare-compatible multiuser applications, Novell had established a de facto LAN standard. A standard now supported by more than 400,000 NetWare users worldwide.

And with the introduction of System Fault Tolerant (SFT™) NetWare, Novell passed another LAN milestone: affordable fault tolerance for nearly all LAN systems.

Moving Ahead.

Today, Novell isn't resting. On past achievements or anything else. While other companies are struggling to reach Novell's LAN milestones, Novell is forging an even bigger lead with new milestones like the Universal Network Architecture (UNA) strategy and the opening of NetWare Centers worldwide. A lead so big that many major LAN competitors are buying Novell technology just to stay in the race.

Being a leader is hard work. But Novell is in front to stay. Because nothing compares to the view from the front. Especially when you look forward to the milestones ahead.

NOVELL

Milestones Ahead.

ARE YOU GETTING THE LATE-BREAKING NEWS TOO LATE?

Is there one person in your company who always seems to be on top of the latest computer trends, issues, products, and breakthroughs?

Chances are, it's the same person whose name is on top of your company's *Computerworld* routing slip. In fact, by the time the company copy gets to you, the hottest news in the computer community may already be lukewarm.

Now's your chance to get your own copy of *Computerworld* delivered to your desk for only 76¢ a week. That's $38.95 for 51 information-packed issues of the computer community's most influential newsweekly.

Computerworld brings you up to the minute news about the world of computers and computer technology. Authoritative news. Timely news. All the news. News you can put to work and use to your advantage.

And, if you subscribe now, we'll send you 12 issues of *Computerworld Focus* — absolutely free. Each issue takes an in-depth look at topics like Software, Connectivity, Communications. And more.

What's more, we offer you a Money-Back Guarantee. If you decide *Computerworld* is not for you, tell us. We'll refund your money on all unmailed issues.

Call toll free **1-800-544-3712** (in Pennsylvania, call collect 215-768-0388) to get your weekly copy of *Computerworld* delivered to your desk for only 76¢ a week. Be sure to act now, before it's too late.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTER INDUSTRY

Section begins on page 94

Third-party micro software support gains corporate attention

By James A. Martin

Just 18 months ago, third-party microcomputer software support companies were virtually nonexistent. Their numbers remain small, but analysts predict that will soon change and a new industry will emerge from several key developments in corporate computing habits.

As micros began to proliferate, the ranks of end users using sophisticated spreadsheet and accounting packages grew. The level of software support from vendors and corporate MIS departments, however, did not always keep up, and the promises of increased end-user productivity did not always materialize.

Last year, one major software vendor, Ashton-Tate, began charging fees for customer support after the initial warranty period, which some say is giving this fledgling industry a strong boost.

"I always thought this was an up-and-coming industry, and the fact that some software companies are now charging a fee for support has guaranteed it," says Amy D. Wohl, president of Wohl Associates, a consulting firm in Bala-Cynwyd, Pa.

Micro Support Resource Corp. (MSR) is one of the few companies now offering third-party software support nationwide for PC end users. After opening its Atlanta headquarters in September 1985, MSR has grown from seven employees in one office to 35 employees supporting some 6,000 end users. Revenue is expected to reach $1 million in 1986.

Other companies are beginning to show interest in third-party software support as well. Businessland, Inc. rolled out a nationwide program last June to offer a variety of third-party hardware and software support packages. Analysts believe it is only a matter of time before a large micro software vendor offers support of other vendor's products — just as hardware vendors such as Honeywell, Inc. and NCR Corp. have entered third-party hardware maintenance.

MSR's Fain

"We do for users what maintenance companies do for hardware — we keep them operational," MSR President Deborah Fain says. "Most companies tend to forget that the user, in terms of dollars, is more expensive than the hardware."

Last August, Ashton-Tate announced that its Systems, Service and Information Division sector would begin providing a range of support services from $50 to $150 per year per user for each software package supported. Other software vendors, seeing the profit potential, are expected to follow suit.

"By charging these fees, the software industry has opened a Pandora's box," Wohl says. Most software vendors do not have a good reputation for support, she says, and, as a result, customers are hesitant to pay for vendor support. "This gives folks like MSR a good chance, and I think there's room in this business for a lot of their type," Wohl adds.

On the other hand, some analysts see third-party companies facing an uphill battle in trying to support other companies' products.

"Third-party companies have to compete with the original provider for service," says D. R. MacNaughton, president of Business Development International, Inc., a consulting firm in Franklin Lakes, N.J. "They can compete on price, probably, but there is the assumption with a lot of people that the guys who wrote Lotus 1-2-3, for example, will be better at maintaining it than someone who didn't."

MSR says it can meet that challenge. Founded by Fain and three colleagues with whom she had worked in support and education at Samna Corp. and Lanier Business Products, Inc., the firm counts Coca-Cola Co. and Greyhound Lines, Inc., a subsidiary of Greyhound Corp., among its customers. MSR offers full telephone support for $150 per user per package for 20 calls on most major PC word processing, spreadsheet and data base software packages.

"There had to be a multivendor system in large numbers in the workplace for our kind of service to be viable," Fain explains. "Before, with office automation products, end users were used to getting all their components and support from one company, like Wang Laboratories, Inc. In the microcomputer environment, these components come from a variety of places."

"The days of manufacturers selling hardware at 35% off and giving free support are gone," according to Miles Walsh, director of Businessland's toll-free Solution Line telephone support service.

It is expected that at least one major player in the micro software industry will enter the market, maybe as early as middle or late 1987.

However, MSR is not worried. "If another company started today, it would take them at least two years to duplicate our data base, and in that time frame we think we can secure enough of the market share to maintain an edge," Fain contends. "If we do a good job, their entrance won't affect us dramatically."

REACH 58,000 DANISH COMPUTER PROFESSIONALS.

Advertise in CW Communications' Danish publications and sell your products directly to Denmark's thriving computer community.

Computerworld/Danmark serves 20,000 key EDP decision-makers throughout the Danish computer community. Each week *Computerworld/Danmark* covers new products and services, current applications and industry trends.

PC World Danmark is the monthly magazine that targets 12,000 IBM PC and compatible users and supplies them with first-hand information on the Danish PC market.

Run reaches 26,000 Commodore owners and potential owners in Denmark. Editorial covers the Commodore market with timely updates on hardware, software, and programs.

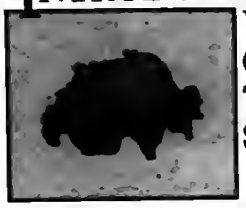
CW International Marketing Services makes advertising your products to Denmark, and around the world, easy. We have over 55 publications in more than 25 countries. For more information on our wide range of services, complete the coupon below and mail today.

CW COMMUNICATIONS/INC.
Frank Cutitta
Managing Director
International Marketing Services
CW Communications/Inc.
375 Cochituate Road
Framingham, MA 01701-9171

Please send me more information on:
☐ *Computerworld/Danmark* ☐ *Run*
☐ *PC World Danmark* ☐ Your other foreign publications
☐ Your brochure "The Computer Marketplace in Denmark"

Name ____
Title ____
Company ____
Address ____
City ____ State ____ Zip ____

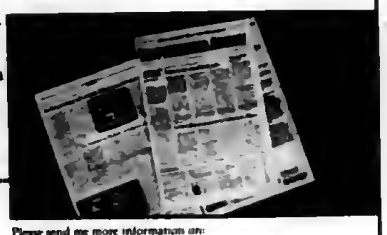
INTRODUCING THE FIRST WEEKLY COMPUTER TABLOID IN SWITZERLAND.



In 1985, Switzerland's total DP expenditures were $3.1 billion. The Swiss computer market is growing at an average rate of 15% per year. The fastest growing segments of the computer market are micros and software.

Computerworld Schweiz is the first weekly tabloid newspaper serving the computer community in Switzerland and covers the latest developments in hardware and software. *Computerworld Schweiz* is modeled after *Computerworld*, its sister publication in the U.S. The editorial provides useful information for data processing professionals, including information on new products and services, new techniques and problem-solving methods and commentary on trends and developments in the computer industry.

CW International Marketing Services makes advertising your products in Switzerland, and around the world, easy. We have over 55 publications in more than 25 countries. For more information on our wide range of services, complete the coupon below and mail today.



CW COMMUNICATIONS/INC.
Frank Cutitta
Managing Director
International Marketing Services
CW Communications/Inc.
375 Cochituate Road
Framingham, MA 01701-9171

Please send me more information on:
☐ *Computerworld Schweiz*
☐ Your other foreign publications
☐ Your brochure "The Computer Marketplace in Switzerland"

Name ____
Title ____
Company ____
Address ____
City ____ State ____ Zip ____

How COMPAQ® advanced personal

Introducing the new COMPAQ DESKPRO

COMPAQ announces a major improvement to the industry standard, one that carries you far beyond the limits of today's "advanced-technology" personal computers. It's the new COMPAQ DESKPRO 386,™ and it reaches far higher levels of speed, compatibility, performance, and expandability than have ever been attainable in personal computers. Dozens of separate enhancements have been combined in one desktop computer to make the COMPAQ DESKPRO 386 the most advanced personal computer in the world. There's no personal computer more ideal for power users, networking and connecting to mainframes.

The new high-speed, 32-bit, 16-MHz Intel® 80386 microprocessor forms the heart of this breakthrough. It's the latest from Intel's family of microprocessors™ that now power well over nine million industry-standard PCs. As such, it single-handedly runs all the popular business *and* engineering software you already own two to three times faster than ever *and* lets you do things today never before possible on personal computers. Plus it's compatible with industry-standard

The most advanced personal

COMPAQ® is a registered trademark. COMPAQ DESKPRO 386™ is a trademark of COMPAQ Computer Corporation. Intel® is a registered trademark of Intel Corporation. XENIX® and Microsoft® are registered trademarks of Microsoft Corporation. Lotus® and Lotus 1-2-3® are registered trademarks; Symphony™ is a trademark of Lotus Corporation. dBASE III PLUS® is a registered trademark of Ashton-Tate.

advanced-technology computers

hardware and expansion boards already available. But the chip is only the beginning of this story.

Each component the very best

Performance enhancements go far beyond the microprocessor. Every component has been optimized to take advantage of the increased speed and power of the 80386.

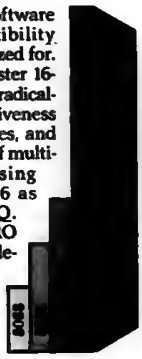
We offer you, for instance, much more memory than most other advanced-technology personal computers. Plus more storage with faster access. A built-in lightpen interface. And even a built-in expanded memory manager.

We quadrupled the capacity of the internal fixed disk drive backup to 40 Megabytes and made it twice as fast as before. We also improved the keyboard, enhanced color graphics, then added a one-year limited warranty. Together, they make this the most advanced personal computer available, and the very first to offer a true minicomputer level of performance in an industry-standard desktop computer.

The winning numbers

The new COMPAQ DESKPRO 386 features advanced 32-bit architecture that processes twice as much information as 16-bit computers in the same amount of time. Yet it retains the unparalleled software and hardware compatibility that COMPAQ is recognized for. Coupled with a much faster 16-MHz processing speed, it radically improves the responsiveness of spreadsheets, databases, and networks, and the ease of multitasking, especially using XENIX. System V/286 as published by COMPAQ. The COMPAQ DESKPRO 386 will also allow the development of powerful new business programs, more advanced engineering software, and artificial intelligence applications.

The COMPAQ Color Monitor works with software designed for a wide variety of display standards. EGA, CGA, and monochrome



The Intel 80386 microprocessor is faster and more powerful than its predecessors.

More of everything

Count on more memory, storage, flexibility, connectability and compatibility for starters. For instance, you can now break the 640K memory barrier *and* use up to 8 Megabytes of high-speed, 32-bit RAM with the COMPAQ Expanded Memory Manager. This software comes standard with the COMPAQ DESKPRO 386 and works with applications that follow the Lotus®/Intel/Microsoft® (LIM) Expanded Memory Specification, allowing you to build bigger spreadsheets, sort larger databases and run more programs.

Get up to 10 Megabytes of RAM without using a single expansion slot; up to 14 Megabytes in all. And get up to 4 internal storage devices. Now you can access even more data faster. Actually 50 to 150 percent faster with our 40-, 70- and 130-Megabyte internal fixed disk drives, the fastest in the industry.

The COMPAQ DESKPRO 386 is an unparalleled value for demanding users. It's built to higher standards with more standard features built in.

History in the making from a company that knows how

COMPAQ reached the Fortune 500 faster than any other company in history because our products work better. The COMPAQ DESKPRO 386 combines superior technology with COMPAQ innovation to offer capabilities you won't find anywhere else.

Some companies may copy one or two of its features, but it will be years before they copy them all. This attention to engineering detail is shared by all COMPAQ Personal Computers, which is why each is the best in its class. And why COMPAQ has the highest user satisfaction ratings in the industry.

The new COMPAQ DESKPRO 386 is available only from over 3,000 Authorized COMPAQ Computer Dealers located worldwide. These computer professionals have already proven their expertise in providing computer users complete business solutions to meet a variety of needs.

For the Authorized Dealer nearest you, or to obtain a brochure, call 1-800-231-0900 and ask for Operator 27. In Canada, call 416-449-8741, Operator 27.

Run industry-standard software 2-3 times faster than ever

It simply works better.

computer in the world

COMPAQ DESKPRO 386™

©1986 COMPAQ Computer Corporation, all rights reserved.

The single best way to turn your PC-AT into a multi-user system.

Introducing the Wyse WY-60.

Now there's a perfectly compatible, reliable, economical, Wyse way to get multi-user mileage from your PC-AT. Wyse WY-60 terminals give you complete compatibility for your IBM Personal Computer AT systems, right down to the exact keyboard layout, character set and display features.

The only thing different is how much cleaner and more readable your information is with the WY-60's high resolution and flat, non-glare, 14" tilt/swivel screen.

You can run most popular PC software, like Lotus 1-2-3, Multiplan, and Wordstar, by using bridges from Alloy or SoftwareLink.

A 512-character downloadable soft font is there when you need mathematical symbols or customized character sets. And our multiple display formats go up to 132 columns by 44 lines.

You can choose from green, white, or amber screens and IBM PC AT or IBM Enhanced PC keyboards. The adjustable arm is optional.

No wonder we ship more terminals than anybody but IBM.*

Call toll-free or write, today, for more information. Wyse Technology, Attn: Marcom Department 60-AT, 3571 N. First St., San Jose, California 95134.

Call 1-800-GET-WYSE

WYSE

YOU NEVER REGRET A WYSE DECISION.

Wyse is a registered trademark of Wyse Technology. WY-60 and the "V" shaped design are trademarks of Wyse Technology. IBM and IBM Personal Computer AT are trademarks of International Business Machines Corporation. WordStar is a registered trademark of MicroPro International. Multiplan is a registered trademark of Microsoft Corporation. Alloy and SoftwareLink are registered trademarks of Alloy Computer Products, Inc., and The SoftwareLink, Inc. respectively. © 1986 Wyse Technology. *Datapro 1985 terminal shipment update.

COMPUTER INDUSTRY

Datapoint's future questioned as CEO leaves firm at crucial point

By James A. Martin

SAN ANTONIO — After several years of financial and management setbacks, the most recent being the sudden resignation of its president and chief executive officer, the future of Datapoint Corp. appears to be at its most uncertain.

The office automation and network vendor lost market share in recent years to mini and microcomputer vendors and reported operating losses in both fiscal 1985 and 1986. Before that, the company suffered lawsuits alleging the firm misrepresented financial results to its shareholders between 1980 and 1982.

In 1985, Asher B. Edelman, a Wall Street financier infamous for buying troubled companies and selling them off in pieces, gained control of Datapoint in a highly publicized corporate takeover.

'Dangerous point'

"Datapoint is at a dangerous point right now," according to Linda O'Keeffe, a director of market research at Dataquest, Inc. in San Jose, Calif. "Users have been nervous since the 1982 scandal and even more nervous since Asher Edelman stepped in. There must be a concerted sales and marketing effort and a unified product positioning strategy to energize sales if they are to survive."

Datapoint recently suffered a further blow with the unexpected resignation of 13-year executive and CEO Edward P. Gistaro [CW, Jan. 19]. Although Gistaro refused to comment on his departure and did not reveal to Datapoint his reasons for leaving, analysts and observers speculated that Gistaro often disagreed with Edelman's vision for the company.

Edelman referred press inquiries regarding Gistaro's departure to a Datapoint spokesman, who said that to his knowledge the two had a good relationship.

Several Datapoint users contacted by *Computerworld* said the company's recent problems have not necessarily translated to their own DP shops.

"Product-wise, the company is in the best shape ever," said David Prybys, director of MIS for Cadillac Gage Co. in Warren, Mich. "The question is, Have too many people been scared away?"

Dana Commercial Credit Corp. in Troy, Mich., however, is phasing out its seven Datapoint 8800 minicomputers in favor of an IBM 4381 mainframe.

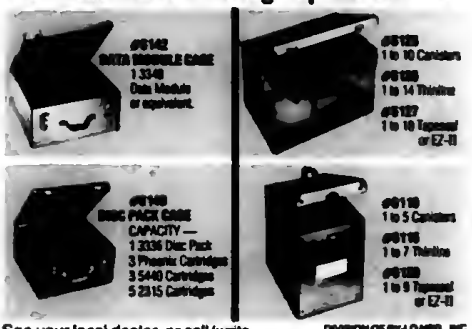
"The growth of our company is why we're migrating to a mainframe," said James P. Jones, Dana's director of information services. "At the time we decided to upgrade, I didn't feel Datapoint had kept up with the technology curve. Over the last year, they've come out with significant technological improvements over what they had, but for us it was a day late and a dollar short."

Technological expertise will not be as important as marketing savvy in the search for Gistaro's replacement, according to Dataquest's O'Keeffe. "The new CEO had better be the world's best marketing executive, otherwise the company is going to continue to face tough times," O'Keeffe said.

In December 1986, Edelman appointed Clark R. Mandigo as president and chief executive officer of Intelogic Trace, Inc., the third-party computer maintenance concern spun-off from Datapoint by Edelman. With no experience in computer maintenance, Mandigo was chosen for his management skills [CW, Dec. 8].

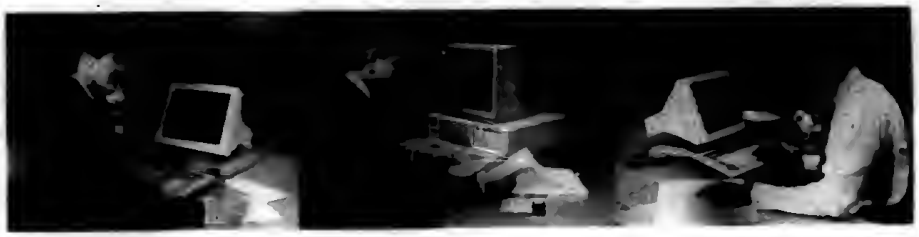
If the company does not make headway in marketing and sales, the possibility is strong that Datapoint will "have to be merged, acquired or form a strategic alliance with another vendor just to survive," according to Andrea Rossi, analyst with Rossi Consultants in Marblehead, Mass.

ALUMINUM
Disc Pack Cases ● Mag Tape Reel Cases



See your local dealer, or call/write —
ALUMINUM CASE CO.
DIVISION OF BY-LO MFG., INC
3333 W. 48th Pl. • Chicago, Illinois 60632 (312) 247-4811

Streamline your DP operations



with a Tandy® 3000 HD XENIX® system.

Break away from your mainframe with the powerful Tandy 3000 HD. The 3000 HD supports the versatile XENIX System V (based on UNIX® System V, the standard of the UNIX world). Extras include a "C-shell" programming environment, a menu-driven help system and support for Tandy peripherals. The high-performance Tandy 3000 HD helps make systems development more efficient and cost effective.

The Tandy 3000 HD is compatible with the IBM PC/AT®, yet offers greater hard disk storage (40 MB vs. the PC/AT'S 30). Better yet, the 3000 HD is priced at only $4299 (vs. $5295 for the PC/AT*).

Based on the 16-bit Intel 80286 microprocessor, the Tandy 3000 HD (25-4011) operates at 8 megahertz. And since the 3000 HD is a multiuser system, people located throughout your office can all simultaneously access it from inexpensive data terminals, for program development, as well as user applications.

Come into a Radio Shack Computer Center for a demonstration today. The Tandy 3000 HD is your key to total office automation.

TANDY COMPUTERS: In Business . . . for Business™

Radio Shack
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

*Based on IBM price list as of April 2, 1986. Tandy 3000 HD price applies at Radio Shack Computer Centers and participating stores and dealers. Monitor, data terminals and XENIX sold separately. XENIX/Reg. TM Microsoft Corp. UNIX/TM AT&T. IBM PC/AT/Reg. TM International Business Machines Corp.

Apple, Microsoft, Tandy report rise in sales, earnings

Stratus, Tandem gain while NCR growth stalls

By Alan Alper and Clinton Wilder

Demonstrating that the worldwide microcomputer industry remains robust, Apple Computer, Inc., Microsoft Corp. and Tandy Corp. last week reported solid growth in sales and earnings in the quarter ended Dec. 31.

Three larger systems vendors targeting the transaction processing market, however, posted contrasting quarterly results. While Stratus Computer, Inc. and Tandem Computers, Inc. continued their recent success, NCR Corp.'s profit growth stalled on a 12% rise in revenue.

Microsoft. Spurred by healthy growth across all product areas, Microsoft registered second-quarter profits of $19.7 million, or 71 cents a share, up 80% from the corresponding period last year. Sales were up 52% to $49.9 million.

President Jon Shirley attributed the favorable results to strong sales through retail channels. He cited, in particular, strong demand for software products for Apple's Macintosh, such as Microsoft Works.

"Microsoft's systems products fell to below 50% of total revenue, which means that their applications products are contributing more," said Thomas Galvin, an analyst with Shearson Lehman Brothers, Inc. in New York.

Apple. Apple's traditionally strong December quarter, which in 1986 included a much higher percentage of Macintosh sales, boosted revenue 24% to $662.3 million. But profits grew by only 3%, reflecting the gross margin pressure that Chairman John Sculley has said will probably result in a year-to-year earnings decline in the current quarter.

First-fiscal-quarter earnings were $58.5 million, up from $56.9 million a year earlier. Per-share earnings remained flat at 91 cents.

Tandy. Buoyed by strong acceptance of its new line of low-cost IBM Personal Computer-compatible microcomputers, Tandy posted a 19% second-quarter revenue gain to $1.19 billion. Net income for the period also rose 19% to $103.8 million, or $1.16 a share.

"We sold more computers in the fourth calendar quarter of 1986 than in the prior three quarters combined," a spokesman for the Fort Worth, Texas, firm noted. He cited exceptionally strong demand for the new computers introduced last July, the Tandy 1000 Models SX and EX.

Earnings for the quarter were lowered by $1.8 million because of the recapture of investment tax credits.

NCR. Tax reform negatively affected NCR's fourth-quarter results. Earnings edged up 1% for the period to $134 million, or $1.39 a share. Revenue rose 12% to $1.5 billion.

The effect of the repeal of the investment tax credit lowered fourth-quarter earnings, the firm said. Tax reform also increased NCR's tax rate by 1.7% to 45.7%.

For the full year, however, NCR achieved record results. Earnings reached $336.5 million, or $3.42 per share, up 7% from 1985, on a revenue increase of 13% to $4.8 billion.

NCR Chairman Charles Exley said the firm finished its fiscal year "in the strongest financial position in the company's modern history." But, he added, "The slump in the U.S. computer market, with its associated pressure on profit margins, remains a major concern. We see no signs as yet of material improvement in domestic business conditions in our industry. However, order strength and profit improvement in our international operations is very encouraging."

Tandem. New products brought out during the past year enabled the Cupertino, Calif., maker of fault-tolerant transaction processors to report a profit increase of 133% to $27 million, or 58 cents a share, for its first quarter.

Revenue was up 40% from the comparable period last year to $238 million.

Tandem Chief Executive Officer James G. Treybig attributed the strong performance to continued international growth and improved domestic order rates. "For example, Texaco Oil AB Sweden chose Tandem systems to implement a point-of-sale application for Sweden, Norway and Denmark," he noted.

"They're growing like gangbusters," said Louis Gilio, a market researcher for Bear, Stearns & Co. in New York.

Stratus. The Marlboro, Mass.-based fault-tolerant vendor capped another impressive growth year with a fourth-quarter profit rise of 52% on a 40% sales increase. Stratus earned $3.7 million, or 19 cents per share, on revenue of $35.3 million.

For the year, sales reached $124.5 million, up 55% from $80.1 million in 1985. Profits grew 57% to $13.5 million, or 70 cents per share.

Stratus was particularly successful overseas selling transaction processors to the newly deregulated brokerage industry in the UK. President William E. Foster also cited several new U.S. accounts in 1986, including American Express Co., the Citibank N.A. unit of Citicorp, the American and New York stock exchanges and Mack Trucks, Inc.

Life-sized

COBOL

SORT 10,000 100-byte records in 43 seconds.

Load 10,000 100-byte keyed records in 36 seconds.

Compile a 10,000 line program in 76 seconds.

Search a 10,000 line source file in 16 seconds.

Hundred-line COBOL programs are common in benchmark tests. In real life, you deal in thousands of lines. So does REALIA.

REALIA is the fastest micro COBOL. It can handle the biggest files. But speed and capacity are only the basics. The compiler, GSA-certified at the high level, offers IBM VS COBOL compatibility and supports ANSI 85 features, such as inline PERFORM and END-IF.

COBOL programs can call DOS, C, and assembler subroutines, as well as accessing BIOS functions via the machine-level interface. The indexed file system handles multiple alternate indexes, with a maximum record size of 32Kb. The interactive symbolic debugger works on your native generated code, instead of requiring an interpreted version. The full-screen editor imposes no limits on file size.

The programs you write are yours to distribute: REALIA charges no run-time or royalty fee.

REALIA gives you the tools you need for real-life development and maintenance projects. Fast, high-quality phone support. Automatic shipment of upgrades, free for the first year. An introduction to the independent REALIA User Group. A 30-day evaluation copy, for qualified companies. Call us.

Get Realistic about COBOL.

$995 includes the compiler, interactive symbolic debugger, editor, and a year of free upgrades and support. Visa / MasterCard / American Express accepted.

REALIA™ COBOL requires MS-DOS™ 2.00 or above; an IBM PC™/PC-XT™, PC AT™, 3270 PC™, or compatible; and at least 160Kb of memory.

REALIA inc.™

10 South Riverside Plaza
Chicago, Illinois 60606
(312) 346-0642
Telex 332579 REALIA INC.

The best things in life are FREE!

And so is your ticket to the Communication Networks '87 Exposition

February 10-12, 1987 — Washington D.C. Convention Center

Come to the 9th Annual **Communication Networks '87 Exposition** — FREE — and get a closer look at the hottest new products in data, voice, and telecommunications.

CN '87 will be the biggest yet. With over 1,000 exhibit booths, over 300 top vendors, and at least 87 new product introductions, it will be THE communications event of 1987.

This is your one-time-only opportunity to study today's top communications hardware, software and service offerings under one roof.

- **Discover product solutions** to your current and future needs
- **Get complete technical data** on new and established products and services
- **Attend demonstrations** of today's hottest equipment
- **Visit with vendors**
- **Evaluate and compare products**
- **Get cost data**
- **Meet your peers** and find out how they're handling problems similar to yours
- **ALL FREE!** Just bring the ticket.

And while you're at the show . . . Register to attend one or more conferences. Choose from more than 65 intensive 90-minute seminars, presentations and discussions on today's most important issues. Conferences focus on technology, user case studies, strategic decision-making, regulations, new products, voice networking issues, industry issues, and how-to "solution sessions." Call 1-800-225-4698 for conference information, including registration fees. Pre-registration is recommended.

Visit these exhibitors for new ways to build and control your communications facilities —

Companies with an asterick are introducing new products at CN '87.
Exhibitors as of December 12, 1986

Account Data Group, The
Adcom Corp
ADC Telecommunications Inc.
* Advanced Computer Communications
Allen-Bradley, A Rockwell International Co.
Almetek Industries Inc.
Amdahl Communications Systems Division
* Ameritec Corp.
AMP Inc.
* Anderson Jacobson
Anixter Brothers Inc.
* The ARIES Group Inc.
Artel Communications Corp.
Arus Corp.
* AT&T
* Atlantic Research Corp.
Atlantis Enterprises Inc.
* Avant-Garde Computing Inc.
Avanti Communications Corp.
* Aydin Monitor Systems
Banyan Systems Inc.
BCR Enterprises Inc.
Bell Atlantic
Bell Communications Research Inc.
* BGS Systems Inc.
Brentec
Bridge Communications Inc.
* Business Communications Review
Bytex Corp.
* Cabletron Systems Inc.
* Canoga-Perkins
Cartenfone Communications Corp.
* CASE Communications Inc.
CDM/McGraw-Hill
C-COR Electronics Inc.
* Cellular One-The Washington/Baltimore Cellular Telephone Co.
Chipcom Corp.
* Chromatic Technologies Inc.
Coastcom
Codenoll Technology Corp.
Codex Corp.
Comintex Inc
Communications News/Telephone Engineer & Management
Communications Products & Systems
Communications Week/CMP Publications Inc.
Complementary Solutions Inc.
Compression Labs Inc.
Computerworld
COMSAT
COMSAT World Systems
Comsearch Inc.
* Concord Data Systems
Connections Telecommunications Inc.
Connex International Inc.
Contel
* Control Cable Inc.
Corning Glass Works
* Creative Management Systems Inc./A Cincinnati Bell Co.
* Cylink Corp.
Data Communications/McGraw-Hill
* Data Communications Institute, The
* Data Communications Systems Corp
* Datacom Northwest Inc.
* Datacomm Management Sciences Inc.
* Datapro Research Corp.
* Dataprobe Inc.
* Dataradio Inc.
* Data Switch Corp.
* Dataset Inc.
Digilog Inc.
* Digital Communications Associates Inc.
Digital Equipment Corp.
* Digital Link Corp.
* Digital Microwave Corp.
* Digital Pathways
* Digital Sound Corp.
* Digital Transmission Systems Inc.
* Digitech Industries Inc.
Dilel Inc.
DMW Group Inc.
Doelz Networks
Domain Systems Inc.
Dorran Photonics Inc.
* DYNAPAC, A Dynatech Co.
* Dynatech Communications Inc.
* Dynatech Data Systems
EBM Communications Inc.
EDA Industries Inc.
* EFData Corp.
Eicon Technology Corp.
* Electrodata Inc.
Equinox Systems Inc.
Ericsson Inc.
Everest Electronic Equipment Inc.
Fairchild Communication Networks & Services
* Fairchild Data Corp.
* FiberCom Inc.
* FiberLAN Inc.
Fiber Optic Product News/High Tech Publications
Fibronics International Inc.
FMW Corp.
Focom Systems
FOCS Inc.
F-O-R-T-U-N-E Communications Group
* Frederick Engineering
General Cable Co.
General DataComm Inc.
General Instrument Corp.
General Instrument Cable Home Communications Group/Network Cable Div.
General Network Corp.
Glassel Communications Inc.
W.L. Gore & Associates Inc.
Government Computer News
Government Data Systems
Granger Associates
GTE Spacenet
GTE Supply
GTE Telephone Operations
Hewlett-Packard Co.
HTL Telemanagement Ltd.
Hughes Communications Inc.
IBM Corp.
* Idacom Electronics Ltd.
Illinois Computer Cable
* INFINET Inc.
Information Gatekeepers Inc.
Infotron Systems Corp.
InteCom Inc.
* Intelco Corp.
International Data Corp
* International Microwave Corp
* W.S. Jenks & Sons
* Jupiter Technology Inc.
KEE Inc.
* Kentrox Industries Inc.
KMW Systems Corp.
* *LAN Magazine*
LanTel Corp.
Lense Corp.
LDX NET
LIGHTNET
Lightwave
* L P COM
M/A-COM
M/A-COM MAC
Mainstream Data Ltd.
Martin Marietta Information & Communication Systems
MCI
MegaRing Corp.
Memotec Datacom Inc.
* Metatek Inc.
Micom Systems Inc.
* Micro-Integration Corp.
* Microwave Networks Inc.
Mountain Bell
Multicomm Telecommunications Corp
* Navtel Inc.
* NEC America Inc.
Netek Inc.
Network Communications Corp.
Network Control Corp.
Network Equipment Technologies
* Network Switching Systems
Network World
* Newbridge Western
* Newbridge Networks Inc.
* North Supply Co.
* Northern Telecom Inc
Northern Telecom/Integrated Data Network Div.
NYNEX Service Co.
* OMNICOM Inc.
OneCom Inc.
* OPT Industries Inc.
Optical Data Systems
Orionics, A Division of Ametek
* Pacific Bell
* Pacific Bell/Project Victoria
* PacTel Spectrum Services
Phillips Publishing Inc.
Photodyne Inc.
Pictel Corp.
Powell-Pendergraph Inc.
Progressive Computing Inc.
Proteon Inc.
* Pulsecom, A Division of Harvey Hubbell Inc
* Questronics Inc.
Racal-Milgo
* Racal-Vadic Inc.
* Racon Inc.
Raycom Systems Inc.
Reliable Electric/Utility Products
Renex Corp.
Residence Inn Co., The
ROLM Corp.
Sargent Cable Services
Satellite Communications Magazine
Scientific-Atlanta Inc.
* Siecor Corp.
Solunet Inc.
Southern Bell/South Central Bell
Spectrum Digital Corp.
Spectrum Planning Inc.
STARNET International Inc.
Stonehouse & Co.
* StrataCom Inc.
Suntel Systems Corp.
* Symplex Communications Corp.
Sytek Inc.
* Talon Technology Corp.
T-Bar Inc.
Technology Transfer Institute
* Teknelec
Telco Research Corp.
* Telco Systems Network Access Corp.
Telebyte Technology Inc.
Telecom Publishing Group/Capitol Publications
Telecommunications Magazine
Telecommunications Products Plus Technology/Penrwell Publishing Co
* Telecommunications Techniques Corp.
Teleconnect Magazine
Teledyne Thermetics
* Telematics International Inc.
Tele Measurements Inc
TeleMonitor Corp
Telenex Corp
Telephony Publishing Corp./*Communications Age*
* Teltabs Inc.
Test and Measurement World
* 3M/Test & Measurement Systems
Timeplex Inc.
Trompeter Electronics Inc
TRW Information Networks Division
Tymnet/McDonnell Douglas Network Systems Co.
Ungermann-Bass Inc.
* Universal Data Systems
US Sprint
US Telecom
US WEST Network Systems
U.S. Robotics Inc.
* Verilink Corp.
Versa-Lite Systems Inc.
* Vitalink Communications Corp
Wandel & Goltermann Inc
* Wang Laboratories Inc.
Wegener Communications Inc.
* Wiltronix Inc.
Xerox Corp
XIOS Systems Corp
XTEND Communication Corp
XYPLEX Inc.
Zenith Electronics Corp
Zeta Laboratories Inc.

Bring this ticket to the show for FREE admission to the exhibits-only

FREE **$5 Value** **FREE**

Admission Certificate

Admit Bearer to the
Communication Networks '87 Exposition
Washington D.C. Convention Center
Tuesday, February 10, 9:30 am - 5:00 pm
Wednesday, February 11, 9:30 am - 5:00 pm
Thursday, February 12, 9:30 am - 3:00 pm

COMMUNICATION NETWORKS CONFERENCE & EXPOSITION

FREE **FREE**

Sytek broadens spectrum, will support Ethernet, TCP/IP

By Peggy Watt

MOUNTAIN VIEW, Calif. — Broadband local-area network developer Sytek, Inc. will broaden its scope to support Ethernet, Transmission Control Protocol/Internet Protocol (TCP/IP) and new transmission media in an effort to shake the stigma of being two years in IBM's shadow.

Sytek will boost their development of twisted-pair and baseband media, said Roger Ferguson, executive vice-president of Sytek. The company already offers fiber-optic connections in a joint marketing effort with fiber-optic developer Codenoll Technology Corp. in Yonkers, N.Y.

Sytek's broader market will pit it against two other Mountain View-based network companies, Ungermann-Bass, Inc. and Bridge Communications, Inc. Ferguson said Sytek is better suited to face the competition after two years of experience as the developer and supplier of IBM's PC Network, which was all but abandoned with IBM's announcement of its Token-Ring network a year ago.

Network industry analyst Harvey Freeman, vice-president of Architecture Technologies Corp. in Minneapolis, said he is optimistic about Sytek's survival and prosperity in its post-IBM era.

"They're going to become a formidable force," he said. While Sytek has to lose its image as IBM's shadow, Freeman said the company is also well positioned because of that exposure. The income from IBM, while temporary, yielded valuable research dollars for Sytek's later products, he said.

"The IBM deal," Ferguson agreed, "was both a blessing and a curse. We learned how to really define and test a product and develop a quality, defect-free product. We've translated that philosophy to our existing products."

Slightly more than half of Sytek's revenue came from IBM, and that income dropped when the contract did. The resulting losses delayed Sytek's plan for a public stock offering in 1987 at least a year, Ferguson added. IBM still owns 15% of Sytek through convertible bonds.

Ferguson said Sytek will offer "clear migration from existing Sytek systems to TCP/IP and other emerging standard protocols." TCP/IP tops Sytek's list because of the great interest in that standard by the military and government, markets that constitute more than half of Sytek's current business.

Sytek is also eyeing General Motors Corp. Manufacturing Automation Protocol/Technical Office Protocol (MAP/TOP) standards. "We are committing to supporting MAP/TOP in the future," Ferguson said. No MAP products will come out of Sytek until MAP 3.0 is released, he added.

"Within 10 days we had the names of the best distributors in three foreign countries."

For nearly two decades, Land Grant has been involved with high tech in a variety of capacities. He is president of Land Grant & Company — a business devoted to export consulting and profitable concepts in global trade for high technology producers.

Land realizes the importance of networking in international business. And, he's been using CW International Marketing Services to help him expand his list of distributor contacts. *"CW's worldwide offices are nodes on a network — in touch with current trends as well as the customers and international middlemen U.S. manufacturers are seeking,"* he explains.

Land discusses how CW International Marketing Services helped his client, Phoenix Technology: *"Locating qualified candidates was one of our first steps in helping Phoenix select the right distributors. Within 10 days, we had the names of the best distributors in The United Kingdom, West Germany and France."*

CW International Marketing Services is the only source, aside from the Commerce Department, that provides comprehensive distributor information broken down by country and product line. *"For years, we had to gather and cross-reference distributor information from a hodge-podge of government and international trade sources. Now, CW provides us with a better source of fast, top-drawer information,"* says Land.

In fact, selected international market information is so scarce, Land is currently writing a guide entitled the *High-Tech Exporter's Sourcebook*. And he plans to continue relying on CW International Marketing Services for distributor contacts. He explains, *"The real added value of CW is its people and expertise in-place around the world."* He adds, *"Because CW Communications is a network of international offices, CW International Marketing Services has worldwide contacts and marketing information unavailable elsewhere."*

To find out how CW International Marketing Services can work for you, call Frank Cutitta, Managing Director, at 800-343-6474 (in MA, 617-879-0700).

Land Grant
President
Land Grant & Company
Brooklyn, NY

CW COMMUNICATIONS/INC.
an International Data Group company

375 Cochituate Road, Box 9171, Framingham, MA 01701-9171

DEC takes slice of Big Blue pie

From page 94

changed appreciably.

IBM's market share losses in the high-end of the intermediate systems market were especially noticeable. DEC's share of the $4.3 billion intermediate systems' annual shipment value at list for systems of $100,000 and up was 49%, nearly three times higher than IBM's 17.5%.

In terms of the "if sold" value of the U.S. installed base at list for such high-end systems, DEC's share of the U.S. market went from 28% to 32% in just six months. IBM's market share, meanwhile, dropped from 35% to 32% in the same time frame.

For the whole U.S. mid-range market, estimated at $5.6 billion, DEC outdistanced IBM by a 1.4-to-1 margin, despite some 12,000 low-priced System/36s that IBM shipped during the same period.

Cash vs. unit shipments

The System/36s were the reason IBM appeared to be doing well in annual unit shipments, with a 61% market share, compared with DEC's 17%. Unfortunately for IBM, bankers and investors look for cash, not unit shipments, before passing judgment on how a company is doing.

Within IBM's intermediate systems, the System/36 is IBM's largest revenue contributor with $872 million of "if sold" value in the U.S. The 4381 shipments have dropped significantly in the first half of 1986 to $510 million, down 40% from their 1985 level of $853 million.

Such a decrease could lead to the conclusion that at times of weak demand, a high level of competition and disparate IBM product lines, the marketplace is no longer so elastic as to react favorably to IBM's aggressive price/performance actions, such as the 4381 announcement IBM made last February.

Of course, one could reasonably argue that such a conclusion may be premature — that there had not been enough time for the marketplace to fully react to IBM's price/performance move. But the figures indicate that one can at least make a strong suggestion that the intermediate systems market was not as price-elastic as IBM had hoped in the first half of 1986.

Introducing the most reliable DEC™-compatible terminal ever built. The TeleVideo 9220.

"Why do we want thousands of TeleVideo® terminals? Because we can't afford thousands of problems."

Susan Kennedy should know. She's a product analyst at Leasametric, a company that rents, sells, and services DP equipment all over the country. Including thousands of terminals. And since reliability is crucial to Leasametric, they tear each evaluation unit apart piece by piece. Then, they give it a series of tests that make MIT exams look easy.

"Too many terminals just don't measure up," says Susan. "I've seen machines with questionable ergonomics...keyboards that flex in the middle when you type... even cheap little diodes that could drop off.

"But TeleVideo starts with solid engineering, and follows through with every detail. Overall, they've built the same quality into the 9220 that's made all their other terminals last so long."

And there's more to the 9220 than quality and reliability. There's also an extended feature set, including full VT-220 compatibility. A super-dark 14" amber screen. A tilt and swivel base. 30 programmable function keys. Plus the best thought-out ergonomics around. All for exactly $619.

The TeleVideo 9220. For more information, or the name of your nearest distributor, call 800-835-3228.

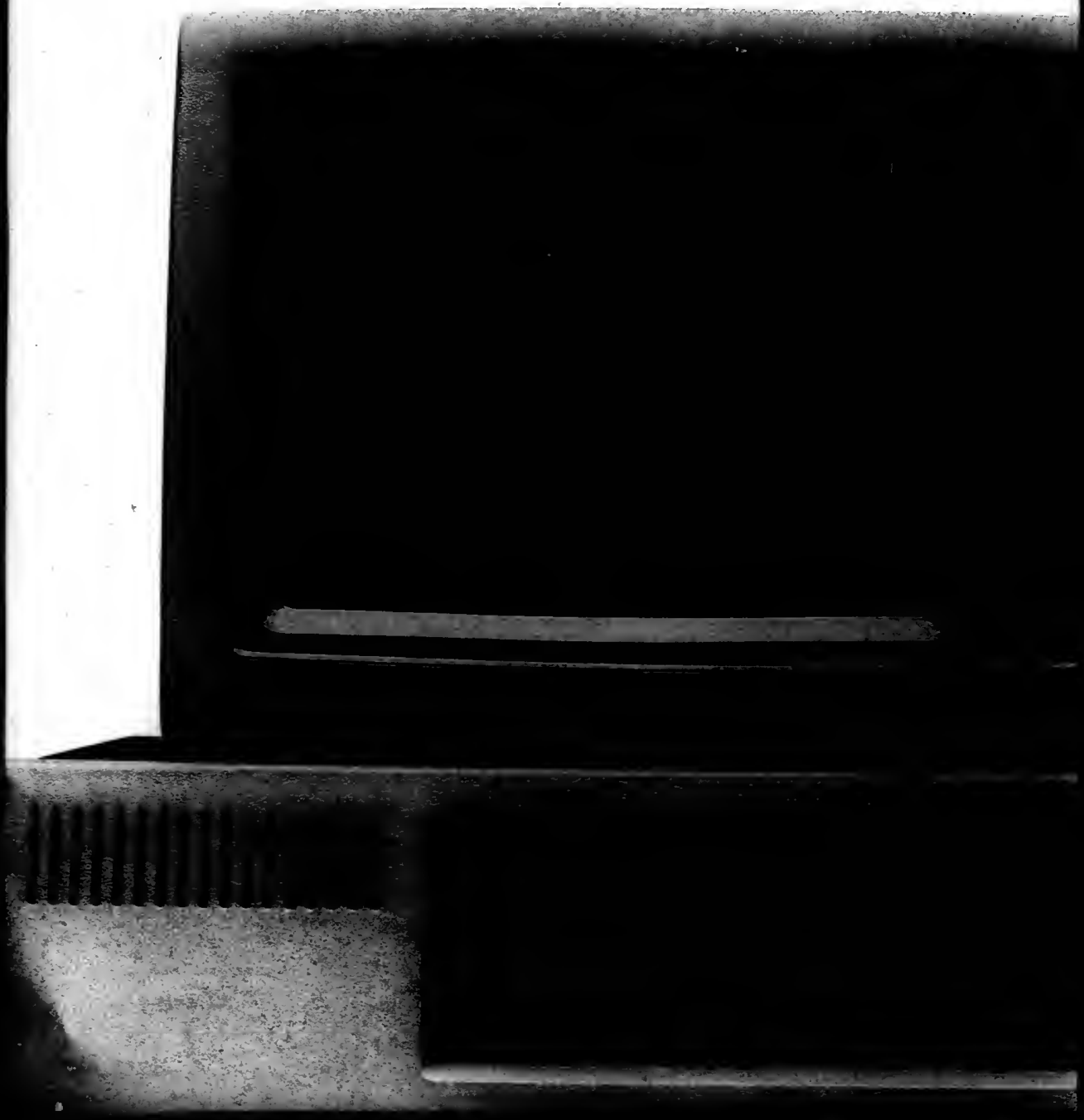
TeleVideo®
Settle for more.

TeleVideo Systems, Inc., 1170 Morse Avenue, P.O. Box 3568, Sunnyvale, CA 94088-3568 (408) 745-7760
Regional Offices: West (408) 745-7760, Southwest (714) 476-0244, South Central (214) 550-1060, Southeast (404) 447-1231, Midwest (312) 397-5400, East (516) 496-4777, Northeast (617) 890-3282. Amsterdam: 31.2503.35444, Paris: 33.1.4687.34.40, London: 44.9905.6464

DEC and VT-220 are trademarks of Digital Equipment Corporation.

©1986 TeleVideo Systems, Inc.

Underachiever.



Using a PC merely as a stand-alone is rather like using a race car to fetch the groceries. A severe case of under-utilization.

But it's a widespread problem. And, since PCs are here to stay, a serious one. So we at Hewlett-Packard did some hard thinking—which resulted in the Personal Productivity Center (PPC). The PPC is an office information system based on the HP 3000 family of computers. It's designed to help you realize the full potential of your PCs, including IBM.

One way the PPC does this is with HP Information Access. It gives your PC users a consistent, relational-like interface to data anywhere in the network. Without special programming. It can save data in a variety of formats, such as 1-2-3® from Lotus® and R:Base™ 5000, right on the PC. This means that its data can be manipulated and analyzed off-line. So your users are less prone to ask you for special reports. Leaving you free to satisfy your users' more important needs.

With HP Advancemail, your PC users can send messages and files to any user on the network, as well as process mail off-line. Which means not only added convenience for your PC users, but less drain on the host system.

All of these capabilities are given to your IBM PC users as well. And every PC user can also send any DCA-compatible file throughout the network, the file automatically being converted to the format which the recipient can read and edit. Your PCs are linked to each other as well as to central data bases—yet they also provide users with their own local processing power and familiar user interface.

The Personal Productivity Center, as you can see, is quite a remarkable achievement. Made more so because it can be integrated with IBM PROFS and DISOSS mainframe office systems. It lets your PC users share printers, discs and tape back-up devices. And it comes from the company with an unsurpassed record of service and support; the company that never stops asking "What if..." about how best to help you fully utilize your PCs.

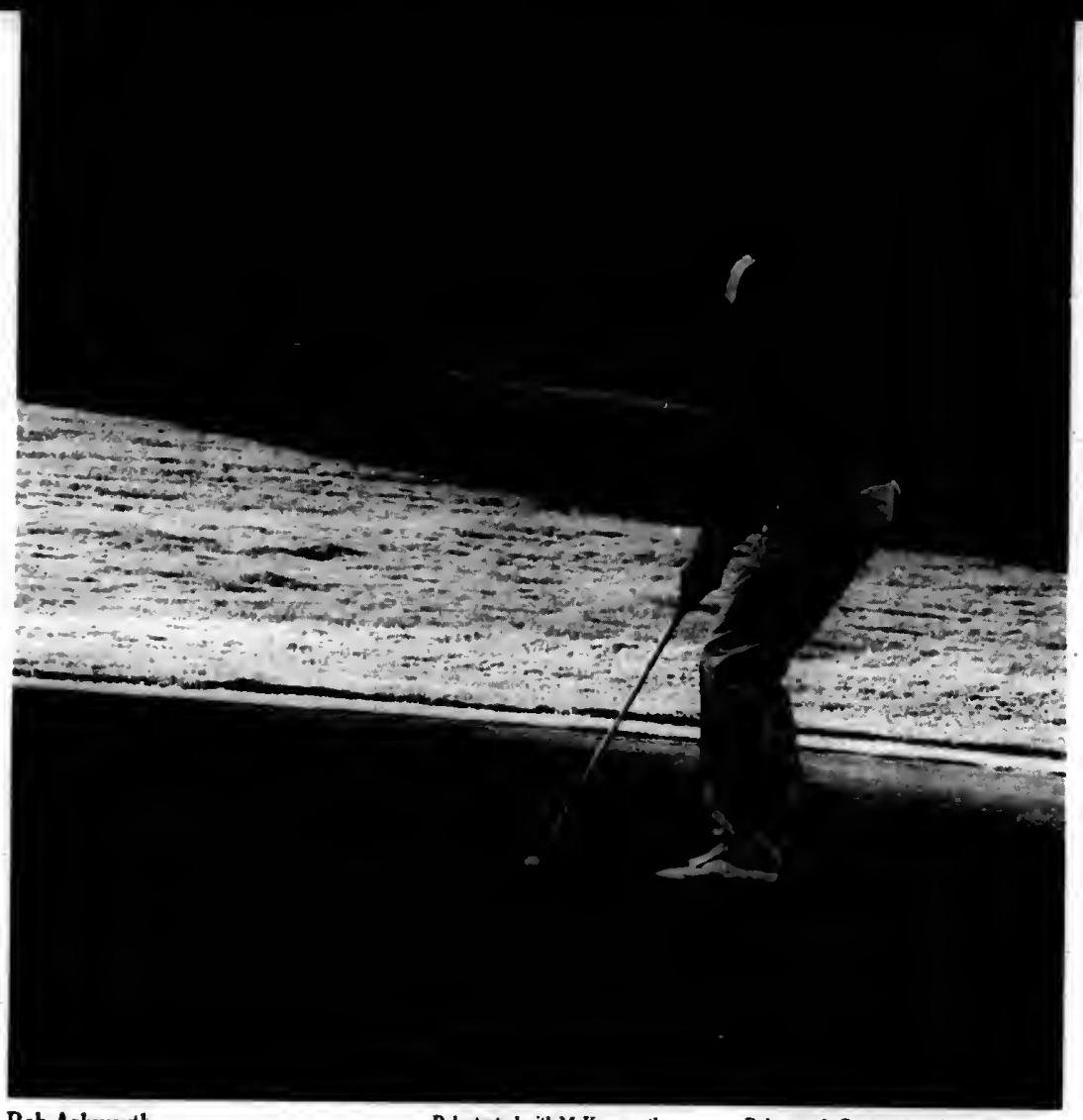
For more information, call 1 800 367-4772, Dept. 282V.

1-2-3® from Lotus® is a U S registered trademark of Lotus Development Corporation
R Base™ 5000 is a U S trademark of Microrim® Inc

HEWLETT PACKARD
Business Computing Systems

© 1987 Hewlett-Packard Co. IS02703

THE INFORMATION TECHNOLOGY LEADERS



Bob Ashworth
VP General Manager
Information Technologies Division
McKesson Corporation
Age: 44
Budget: $65 million
Golfer

With micros, networking and telecommunications becoming more important every day, the influence of Information Services is extending well beyond its traditional boundaries. And with it, the influence of IS professionals. Bob Ashworth and thousands of other aggressive computer professionals like him are clearly on the fast track in America's larger corporations, controlling more than $120 billion every year.

Bob started with McKesson, the world's largest distributor of pharmaceutical products, as a project manager in applications development. His biggest single responsibility: the implementation of McKesson's proprietary Economost micro-based inventory/ordering system for druggists, which has often been credited with the company's fast rise to leadership in the highly competitive pharmaceutical distribution industry. With Economost running smoothly, Bob's attention is primarily devoted to serving the corporation at large. That means providing decision support for those who need it, guiding the company in its acquisition of PCs (600 to date), and assessing the potential applications and value of a corporate LAN.

In his spare time, Bob's an avid golfer, a snow skier, water skier and a jogger.

As you can see, Bob's schedule is full. But if you want to reach him, there's one surefire way.

Send him your message in Computerworld, which he's been reading for 10 years.

Bob regards Computerworld as one of the essential tools of the trade. He finds it gives him the big picture far better than any micro book can.

Information Services is full of bright individuals with individual visions. Yet they all seem to have one common insight.

Their favorite newspaper.
Computerworld.

Where you can read the future

Computerworld, 375 Cochituate Rd., Box 9171
Framingham, MA 01701-9171 (617) 879-0700
A CWCI Publication
An International Data Group Company

BUY - SELL - SWAP

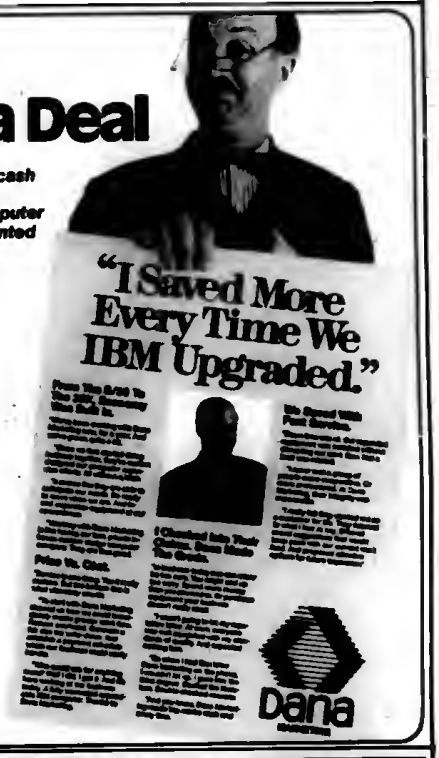
IBM SYSTEMS, PERIPHERALS, UPGRADES

SYSTEM 36
SERIES/1
SYSTEM 38
SYSTEM 34
PC, XT, AT
4300/3080
DISPLAYWRITERS
DATAMASTERS S/23

BUY, SELL, LEASE 612/894-2200 BUY, SELL, LEASE
ALSO: FINANCE & OPERATING LEASES FOR ALL SYSTEMS & PERIPHERALS
Valley Computer & Financial, Inc.
12205 Nicollet Avenue, Burnsville, MN 55337

The Dana Deal

Learn how to increase cash flow. Lower overhead. And upgrade your computer system with fully warranted IBM hardware. Fast. Ask for The Dana Deal.



Outside California
(800) 433-4148
Los Angeles, California (213) 212-3111
Dallas, Texas (214) 248-8588
Stamford, Connecticut (203) 359-8040
Columbus, Ohio (614) 899-0204

IBM SPECIALISTS
• New and Used
• All Peripherals
• Upgrades and Features
• Financial Options
• Complete Delivery
• Complete Return Policy
800-251-2670
IN TENNESSEE

CMA
COMPUTER MARKETING of Nashville, Inc.
P.O. BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

BUYING?
Whether you're looking for big computers little computers, terminals, printers, software, time sharing or services, you'll find it in Computerworld classifieds.

Pages of ads every week, with everything from Discs to DEC's from time sharing to terminals, and software for every size computer system.

You'll find what you need in Computerworld classifieds.

Call 800-343-6474 (or 617-879-0700) for more information

• Buy • Sell • Lease • Rent
IBM. Displaywriters
SOFTWARE — FEATURES — UPGRADES
WE REPAIR ALL DISPLAYWRITERS AND PRINTERS
5525 — OFFICE SYSTEMS 5219 — 5253 — 5258
6670 PRINTERS SYSTEM/34/36
Up to 50% SAVINGS on FACTORY RECONDITIONED
WANG
WPS/OIS VS Equipment
All equipment is covered by the Wang Service Contract
CDB FINANCIAL INC
3520 DIDIDC RIAE
DALLAS, TEXAS 75228
214 324 3481
Member CDL

IBM BUY · SELL · LEASE
36
4300
38
SERIES 1
IBM SER

IBM UNIT RECORD EQUIPMENT
DISK PACKS · DATA MODULES · MAG TAPE · DISKETTES

SALE OR LEASE
IBM UNIT RECORD MACHINES
026—029—082—083—084
085—087—088—129—514
519—548—557—188
NEW & USED
DISK PACKS—DATA MODULES
2316—3336(1)—3336(11)—3348(70)
MAG. TAPE-DISKETTES
Every Item Guaranteed
Highest Prices Paid for Used Packs & Modules
THOMAS COMPUTER CORPORATION
[illegible] W. Howard St. Chicago, [illegible]
800 621 3906 [illegible]

BUY SELL SWAP

yes

WE WILL SAVE YOU MONEY
WE WILL GIVE YOU QUICK DELIVERIES
WE WILL CONFIGURE TO YOUR SPECIFICATIONS
WE WILL PROVIDE YOU WITH QUICK QUOTATIONS
WE WILL GUARANTEE ALL EQUIPMENT
WE WILL BE WAITING FOR YOUR CALL
WE WILL WORK HARD—WE WANT YOUR BUSINESS

CALL US . WE'LL TELL YOU HOW

WE BUY · SELL · LEASE
34 · 36 · 38 · SERIES 1 · 4331-4381
ALL PERIPHERAL EQUIPMENT
ALL UPGRADES

CALL: 800-238-6405
IN TN: 901-372-2622
IN NC: 919-884-0879

CB
COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TN 38134
"SINCE 1974"

asco

BUY SELL SWAP

SERIES/1

ECONOCOM USA

IS THE SOURCE FOR SERIES/1
• BUY
• SELL
• LEASE

NEW OR USED

ECONOCOM-USA, INC.
940 CROSSOVER LANE
P.O. BOX 240297
MEMPHIS, TN 38124
800-238-3066 or 901-767-8130

BUY SELL SWAP

We Buy & Sell
DEC
Systems
Components

Digital Computer Resale

call:713 445-0082
600 Kenrick Ste C22
Houston Tx 77060

3704
3705 3725
BUY • SELL • LEASE
Call Toll Free
800 532-7532
Centron DPL Company

BUY SELL SWAP

Sale or Lease
3890-B05
Call for Price with Features
(800) 821-0229
(818) 986-2411

SYSTEM 38
Model 500 & 700
Available Now
Substantial Discounts
Call Al at
Newport Leasing Inc
(714) 770-2122

REAL ESTATE

FOR SALE
DATA PROCESSING FACILITY
* 15,771 sq. ft.
* Computer raised fl.
* 9.6 acres land
* 10-12 ft. ceilings
* loading dock
* Halon system
* Near major highways
* Central PA area

Commercial-Industrial Realty Company
717-761-5070
Contact: William A. Siverling or Patti Chelap

3083 EX 16x16
3083 J 16x16
(800) 821-0229
(818) 986-2411

Inflation Fighters
Quality & Savings
Slightly used, Money Back Guarantee, Full Reels, All External Labels Removed Guaranteed for use at 1600 BPI through 6250 BPI

2400' Reel	$4.95 ea.
1200' Reel	$4.50 ea.
600' Reel	$3.75 ea.

All Tapes with Hanging Seals
We pay freight on orders over 200 tapes.
All orders shipped within 48 hours.
Call or Write
Computer Tape Mart
44A Seabro Avenue
N. Amityville, New York 11701
(516) 842-8512

IF YOU'RE BUYING, YOU'RE SELLING.
36
38
4300
IF YOU'RE SELLING, YOU'RE BUYING.
IBM SYSTEMS Buy • Sell • Lease PERIPHERALS
(800) 331-8283
TOLL FREE
(213) 306-9343
CALIFORNIA
Ocean Computers, Inc.
8055 W. Manchester Ave., Ste 525
Playa Del Rey, CA 90293

LEASING A LARGE COMPUTER?

Look For The Best Deal In The Classified Pages of COMPUTERWORLD

To place your ad or to get a 1987 rate card with complete details on Classified Advertising write:
Computerworld
Box 9171
Framingham, MA 01701-9171
or call **800-343-6474** (or **617-879-0700**)

1987 COMPUTERWORLD CLASSIFIEDS WORK!

- POSITION ANNOUNCEMENTS
- BUY SELL SWAP
- SOFTWARE FOR SALE
- SOFTWARE WANTED
- TIME & SERVICES
- REAL ESTATE
- BUSINESS OPPORTUNITY
- SEMINARS/CONFERENCES
- BIDS AND PROPOSALS

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or camera ready mechanical, stat or film negative of your ad, just call one of our ad-takers at 1-800-343-6474. They will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (telecopier service is available); note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with your insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

Ad closing is every Friday, 6 working days prior to issue date.

Rates: Open rate is $176.40 per column inch. Columns are 1 13/16" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs $352.80 per insertion. Additional space is available in half inch increments. Some sample sizes and costs are shown.

1 col X 4" - $ 705.60	2 cols X 5" -$1764.00
2 cols X 4" -$1411.20	2 cols X 8" -$2822.40

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available, $15 per insertion. To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

Boston - (617) 879-0700
or (800) 343-6474

San Francisco (415) 421-7330

TELECOPIER SERVICE - (617) 879-0700 or (800) 343-6474
ext. 451 or 410

Cynthia J. Delany, Classified Operations Manager

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

PRIME

TSI - the oldest, largest and most experienced supplier of third party peripherals, memories and controllers for Prime users
BUY • SELL • LEASE • RENT
NATIONAL 800-222-DISK
FLORIDA 800-421-4135
Thesaurus Services, Inc., 4080 Woodcock Dr., Jacksonville, FL 32207

LARGE SELECTION OF USED PRIME COMPUTER SYSTEMS
... SAVINGS TO 50%
Peripherals also available
1st SOLUTIONS, INC.
11460 N. CAVECREEK RD.
PHOENIX, ARIZONA 85020
(602) 997-0997
ASK FOR DON

QANTEL

BUY SELL LEASE
QANTEL/NEC
CALL PROMPT COMPUTER
Dan Kobie
(216) 248-2898

DATA GENERAL

Want To Buy
MV10000 CPU
Fob Delivery
With Or Without Peripherals
Catalina Computer
1005 West Arbor Vitae
Inglewood, CA 90301
(213) 216-5841 FAX (213) 649-1065
Data General Specialists

Your Ad
Could Be Here
For
$178.00

WANG

HOLSON ASSOCIATES, INC.
Buy And Sell
Guaranteed
For Wang Maintenance
2470 Windy Hill Road, Suite 253
Marietta, GA 30067
Call: Richard Holley or Carole Benson
(404) 980-1700

BUY - SELL
MVP/LVP • OIS • VS • PC
SYSTEMS IN INVENTORY
VS-45 • OIS • VS-100
GENESIS
EQUIPMENT MARKETING
GEM
(602) 277-8230

HEWLETT PACKARD

TERMINAL SPECIAL
HP 2392A
and
ZENTEC 8392
Quantity Pricing Available
All in stock - Immediate delivery
Subject to prior sale
All warranted to qualify for manufacturer's maintenance
BUY * SELL * RENT * LEASE
Processors * Peripherals * Systems
From the HP 3000 Experts!
800/843-4954 213/829-2277
ConAm Corporation
It's Performance That Counts!

HP 3000 • 1000
9000 *and now* 250
Buy & Sell Worldwide
ENCORE
(213) 452-9117
Telex 756827

HP 3000-37
2 MB Memory, 160 MB Disk
1600 BPI Tape, 300 LPM Printer
1-4 Terminals
Large Discount
Optional Software
PS/PY, GL, AP, AR, FA, IN, OE, PO
Contact Keith:
513 433-5012

BURROUGHS

BURROUGHS
BUY • SELL • LEASE
Systems * Processors * Peripherals
• All "A" Series
• All Peripherals
• All Terminals
• All Convergent Technology
• All BX800 & BX900 Series
"January Specials"
B9484-51 208 Disk Drive
B9494-41 207 Disk Drive
B9825-B9825-B1895
Burroughs B20 Memory Upgrades
B20-B21-B22-B25-B26 etc.
Depot Maintenance
Universal Financial
1-800-558-5866 (312) 279-1180

DEC

DEC NEW & USED
BUY • SELL • EXCHANGE
Systems • Processors • Memory
Options • Peripherals • Modules
LAKEWOOD COMPUTER CORP.
436 Link Lane
Ft. Collins, CO 80524
(303) 493-8466

BUY • SELL • LEASE
DEC
VAX PDP11
New • Used
DCI
(404) 451-8448

BUY • SELL • TRADE
Planning to buy non-DEC memory?
Check our DEC memory prices first

11750-FA	H7140-AA	MSV11-JC
BC29V-50	MS11-PB	MSV11-OC
DW11-AA	M8930-CA	RL02-AK
H7112-A	MS750-CA	VT102-AA

NEW YORK COMPUTER EXCHANGE
(516)752-8686 (800)645-9109

DECMATE II
LQP02-AA, LA100-CA
Immediate Delivery
CALL TIM
Boston Financial & Equity
(617) 267-2900

HONEYWELL

HONEYWELL SPECIALISTS
LEVEL 6 DPS 6 SERIES 16
The Recognized Leader
In Honeywell Minicomputer
Sales And Support
* Complete Minicomputer Line - New and Used
* All Peripherals and Terminals
* Upgrades and Features
* Depot Repair Capability
* Honeywell Maintenance Guaranteed
* Immediate Delivery - Low Prices
617-393-4839
TWX 710-347-7574
Boudreau Computer Services
Since 1974
100 Beartoot Rd
Northboro, MA 01532

IBM

$/34 . $/36 . $/38
Upgrades/Peripherals
Lowest Price
Call Collect (404) 475-7507
Detamarc Computer Sales
750 Branch Dr, Alpharetta, GA 30201

New Years Special
Immediately Available
IBM 5360B23
$24,500.
(212) 279-4467 (800) 532-0692

4361, 4381
All Models Available
Call Russ Schneider
800/426-4341
in TX 408/241-3677
Marketex Computer Corp.

$/38 $/36 $/34
SERIES 1
BUY - SELL - LEASE
Systems, Peripherals & Upgrades
Source Data Products Inc.
800 Menlo Avenue # 300
Menlo Park, CA 94025
800/338-3888 415/328-7300

BUY • SELL • SAVE $
IBM DISPLAYWRITERS
34'S, 36'S, 38'S
PERIPHERALS
LRK RESOURCES UNLTD INC
CALL LAURIE OR RICK
713-437-7379

S/36 S/38
Buy - Sell - Lease
We Pay Cash
for your used equipment
1-800-LEAS-PAK
In Texas: 1-800-722-7811
D/FW Metro: 267-2841

3180
3178, 3179,
3278, 3274
All Other IBM Units Available
Call Penny 800/426-4341
In CA 408/241-3677
Marketex Computer Corp.

DISKCO MARKETING CORP
BUY & SELL
Displaywriters
34's, 36's, 38's, 4300's
Call 1-800-335-4443
In Texas 806-797-1823
4910 Frankfort Ave
Lubbock, TX 79424

PRINT TRAINS
IBM 1416 & 3216
Bought - Sold - Lease
Repaired - Reconditioned
COMPU-ACT
COMPANY, INC.
(513) 863-2461

9335's
30 Day Availability
$/38-600
Available Now
Ocean Computers Inc.
Call Chuck Or Tom
1-800-331-6263 213-308-9343

FOR SALE/LEASE
3880-003's
3380-AA4's
& B04's
Shelbornet Computer Co.
(512) 836-3800

SALE/LEASE
3420-6
3420-8 3803-2
Call Howard King
(914) 238-9631
Computer Merchants Inc.

SALE/LEASE
3380-AA4
3380-B4 3880-3
Call Howard King
(914) 238-9631
Computer Merchants Inc.

FOR SALE
IBM - 4381 M - 13
with console
IMMEDIATE DELIVERY
Please Respond To: CW-84878, Computerworld, Box 9171, Framingham, MA 01701-9171

For Sale
IBM 3864-2
MODEMS
Safety-Kleen Corp.
Dan Walters
(312) 697-8460

IBM 3725
Communications Controller
LEASE OR SUBLEASE
IBM maintained
Boston Financial & Equity
Tim
(617) 267-2900

MISC.

NEW & USED
RAISED FLOORING
Immediate Delivery
Quality Installation
RAISED COMPUTER FLOORS
One Charles Street
Westwood, NJ 07675
(201) 666-5200
Telex #13-5076

PILLER MG's
• Remanufactured
• Fully Tested
• Warranty
• Sale or Lease
SOUTHEASTERN ELECTRONIC CONTROL SYSTEMS
(404) 938-0380

FOR SALE
Complete Four Phase systems. No reasonable offer refused. Some unreasonable offers will be accepted. Contact Greg Parker or Fred Browning (812) 742-1181 or 1-800 841-8463.
Chester Medical
Information Services

TIME & SERVICES

If you have time available
on a computer...
or if you're offering
a special service...
Tell more than 687,000
computer-involved
professionals with an ad in the
Time & Services section of
Computerworld's
classified pages.
Place your ads today.
Call toll-free (800) 343-6474
or in Massachusetts
(617) 879-0700

DEC SPECIALISTS
VAX 8600 & PDP-11
TIME SHARING
NO CPU CHARGES
$7/$10
RSTS/E VMS
PER HOUR
CONNECT TIME
BUDGET BYTES™
212-944-9230
EXT 110
| | TIMESHARING
| | GENERAL CONSULTING
| | SOFTWARE DEVELOPMENT
| | FACILITIES MANAGEMENT
| | COMPUTER EQUIPMENT & SUPPLIES
| | HARDWARE MAINTENANCE (NY METRO AREA)
| | MEDIA CONVERSION
| | EXECUTIVE SEARCH
| | SOLOMON ACCOUNTING SOFTWARE
Omnicomputer, Inc.®
1430 Broadway, New York, N.Y. 10018

COMPUTING SERVICES

OS 1	OS 2
MVS/XA	VM/370
CICS	DOS/VSE
IMS	CICS
TSO	CMS

** IBM HARDWARE
** FULL TECHNICAL SUPPORT
** FOURTH GENERATION LANGUAGES
** NATIONWIDE ACCESS
** GUARANTEED RESPONSE AND AVAILABILITY
** FULL DISASTER RECOVERY BACKUP
** ON SITE CUSTOMER AREA
** FULL SECURITY
** VOLUME AND TERM DISCOUNTS
For more information please contact
BURNS COMPUTING SERVICES, Inc.
10 Gould Center
Rolling Meadows, IL 60008
Midwestern Sales (312) 991-4000
Eastern Sales (203) 488-1170 • (516) 366-3000

ICOTECH
Innovative Computer Techniques
DATA PROCESSING SERVICES
IBM 3081 DEC 10 VAX 8600
• Batch Processing
• Timesharing
• Microfiche
• Public Network Access
• Laser Printing
• Optical Mark Reading
Introducing . . .
the ICOTECH
Health & Safety
Information System
Route 202 • Raritan, N.J. 08869
201-685-3400 • Contact Joyce Bugenski

Researching all your
options will show you
that your best source is
COMPUTERWORLD

POSITION ANNOUNCEMENTS

IMS Professionals

• 5% Sign On Bonus

We're one of the top DP consulting firms in the nation—with 20 offices across the country— and with annual sales running at $50 million. Our customers are leading companies in many fields...communications ...banking...energy...brokerage...insurance. And they need the consulting services of top professionals like you.

CHC has successfully established itself as a leader in providing IMS technical consulting services in support of applications development, database support, software development and maintenance. Additionally, our Education Division is being kept extremely busy providing classes in all areas of DB2 technology.

Continued demand for our services has created several high paying technically challenging and personally rewarding opportunities for IMS professionals who are ready to step up to consulting status.

We need many experienced D.P. professionals with IMS DB or DB/DC experience gained as a programmer, programmer analyst or senior P/A, and DBA or systems programmer plus involvement in one or more of the following:

...COBOL...PL/1...MSF...ADF...Data Dictionary...

IF SELECTED - As a result of this ad we will pay you a sign on bonus, equivalent to 5% of your starting salary paid to you on your 90th day of employment.

PLUS - An extremely attractive starting salary and a complete benefits plan that includes a 401K tax deferred retirement program and relocation assistance.

PLUS - complete technical support and a full array of in-house technical classes designed to support your technical specialty.

Call or send resume in confidence to:

Barbara Maxwell, Director of Recruiting
Mid-Atlantic Region
201-539-7800 or
(800) 524-2339 (outside of New York)

COMPUTER HORIZONS CORP.®

4 Century Drive
Parsippany, N.J. 07054

An Equal Opportunity Employer M/F

RPG II PROGRAMMER/ANALYSTS

FRANKFURT, WEST GERMANY

Openings for proven, highly motivated RPG II programmer/analysts. Requires 3-5 yrs intensive experience designing/programming systems in RPG on S/34, S/36, S/38. Successful applicants will be able to analyze complex systems, produce accurate code rapidly, work independently, and have excellent interpersonal skills. Civilian employment with the U.S. Army. Salary, including tax free housing allowance, approximately $36,000. Relocation paid. Many other benefits included. This dynamic program provides the opportunity for professional advancement, travel, and security. Send resume to:

RPG PROGRAMMERS
USACFSC-ARMP
APO NY 09090-5205
Attn Mr. Douglas

CONSULTANTS

Advanced Programming Resolutions, Inc., a dynamic growth-oriented, computer consulting company, has Engineering Consulting positions available in Chicago and Columbus, and Business Consulting positions available in Columbus.

APR provides you with an excellent salary, comprehensive benefits including major medical, dental, long-term disability and a 401K pension plan, and the opportunity for professional growth and development.

Engineering Consultants for Chicago and Columbus requires:

- B.S. in Computer Science; M.S. a plus
- 1 (yr.) or more work experience in any of the following areas:
  - Real-time software design and development within a UNIX/C environment
  - Call processing software design and development
  - Switching system requirements and architecture
  - System integration, system testing, and device drivers
  - Operating systems development, and local area networks

Business Systems Consultants for Columbus requires:

- (3-5 yrs.) minimum working experience in any of the following areas:
  - IDMS, IMS/DB, ADABAS
  - ROSCOE, DATATRIEVE, VSAM, VTAM, OSICL
  - COBOL, PL/1, ASSEMBLER, FORTRAN
  - MANTIS, NATURAL, ADSO, IDEAL, CICS, IMS/DC
  - VAX/VMS, DOS/VSE, VM, MVS
  - NCR environments including PARADOX

OUR SUCCESS IS OUR PEOPLE!

Please submit your resume to:

Robert D. Williams
Manager of Corporate Recruiting
Advanced Programming Resolutions, Inc.
2715 Tuller Parkway Drive
Dublin, OH 43017
(614) 766-0881

An Equal Opportunity Employer M/F/H/V

UNIX is a trademark of AT&T Bell Laboratories

APR

Start the New Year off right!

all levels of

DATA PROCESSING PROFESSIONALS

NATIONWIDE

It only takes a call to Dunhill of Anderson to ascertain job opportunities available to Data Processing Professionals.

Our office specializes in locating experienced
- Programmers
- Programmer Analysts
- Systems Analysts
- Systems Programmers

for the most respected corporations in the nation.

We don't require an obligation and we never charge a fee. All matters are held in strictest confidence.

Please mail resume to Annette Thompson-CW or CALL COLLECT 1-803-224-7917

Dunhill OF ANDERSON, INC.
P.O. Box 2585
Anderson, SC 29622

DP OPPORTUNITIES

VP, MIS, Insurance	Open
DBA, ADABAS	To $45K
Sys Programmer, MVS, VTAM	Open
P/A, RPG II, Mfg exp	To $40K
P/A COBOL, PL/1, CICS	To $35K

Call or submit resume to Gil Taylor or Mike Young today for these and other positions. No fee to our applicants.

ROBERT HALF of Lexington
3070 Harrodsburg Rd., Ste. 150
Lexington, KY 40503
(606) 223-5005

FLORIDA CONNECTION

ALL EXPENSES PAID

PROJ. MGR. Retail Sys. MVS	To $60K
ATE Engineer, Atlas	To $45K
Sr. P/A - IMS/DL1, PL1, CICS	To $40K
Silver Eng., RADAR, Pascal, Ada	To $45K
Capacity Planner - MVS	To $35K
P/A's - IDMS, IMS, CICS	To $38K
DBA's - IDMS, IDD	To $38K

Many other positions available throughout Fla. & the Southeast. Call Russ Gray today!

AVAILABILITY, INC.
813 872-2531
Dept C P.O. Box 25434
Tampa, Florida 33622
Since 1966

MIS Professionals

Our Fortune 100 Corporation has immediate career opportunities for MIS Professionals seeking visibility, technical development, and rapid advancement. These positions are available as the result of a major expansion and reorganization of the MIS function in response to the corporation's business growth. You will have the opportunity to enjoy working in a dynamic environment utilizing IBM's most current state-of-the-art technology.

- Director of Systems and Programming $125K
- Director of Business Consulting $100K
- Manager of Technical Support $90K
- Data Base Manager IMS/IDMS $75K
- Systems Consultant $60-75K
- Project Managers/Applications Development $60K

Our company offers excellent benefits, a comprehensive relocation package, and a very attractive Midwest location ideal for family living. For consideration, send your resume in confidence to:

Box #CW-B4877
Computerworld
Box 9171
Framingham, MA 01701-9171

Equal Opportunity Employer

Maricopa County Department of Technology and Information Systems

SYSTEMS GROUP MANAGER HEALTH SERVICES

Annual Salary Range: $39,458 - $55,619

The Department of Technology and Information Systems is seeking a strong and experienced results oriented manager for our Health Services Group. This manager will direct a staff of 16 analysts and programmers, plus contractors to develop and implement several large scale application systems using a DBMS and 4GL tools.

This is a highly visible position requiring excellent management, organization, planning and communication skills. Ideal candidate will possess an understanding of on-line systems, structured techniques, DBMS/4GL use and systems integration. Knowledge of Hospital Systems is highly desired but not mandatory.

Maricopa County provides competitive salary, benefit plans and professional challenges.

Resume and applications required by February 20, 1987. For information and applications write to: Maricopa County Personnel Department, Recruiting and Selection Division, 2nd Floor, 111 South Third Avenue, Phoenix, AZ 85003 or call (602) 262-3755.

Equal Opportunity Employer

NYC Fire Dept. is recruiting for 5 computer related positions:

Assistant Project Leader: *Duties*: Provide technical support & enhancements for an on-line transaction system in a Sperry 1100 environment & involvement in all phases of systems development. *Reqs*: Experience in at least 2 of these: DPS-1100, DMS-1100, Univac Cobol, SSG, TIP, IRU.

Computer Coordinator: *Duties*: Conduct operational research with statistical & simulation software & provide LAN maint. & user support. *Reqs*: Sperry 1100, AT&T 3B2, PC, Unix & DOS, C, Pascal, Fortran & relational DB.

Programmer: *Duties*: Develop & maintain complex interactive & batch Cobol programs & manage related large data files. *Reqs*: Univac Cobol, SSG & DPS, MS-DOS & PCs, Unix a plus.

TC Specialist: *Duties*: Provide PC user support & develop customized software. *Reqs*: PC & communications (LAN), Unix, MS-DOS, C, Informix, Fortran, & Pascal.

Computer Specialist: *Duties*: Writing Assembler codes, operating system modification, & frequent design work. *Reqs*: DEC PDP 11/70, Macro 11 & RSX11M a plus.

All positions require at least a BS in Computer Science & 2-3 years related experience.

Send resume to: Dominic Morelli, Civilian Personnel Officer, NYC Fire Dept., 250 Livingston St., Brooklyn, NY 11201

EEO/M/F/H

Data Base Administration

Connecticut Natural Gas Corporation has an opening for a senior person in the data base administration section of management information systems. Duties include data base analysis, design, and maintenance, in addition to the maintenance of a data base query language and data dictionary.

The ideal candidate will possess a four year college degree preferably in computer science, have one or more years experience in data base design and analysis and a proven track record of increasing responsibility in data processing, over a period of four to five years. Applicants with Sperry 1100 and DMS-1100 experience will be given preferred consideration. Salary for this position is in the high 30s commensurate with experience.

CNG is a Hartford, CT based utility with a state-of-the-art computer facility and a varied portfolio of applications systems utilizing batch and on-line data base technology. We offer a modern work environment and excellent benefits package and competitive salaries. Qualified candidates should send their resumes with salary requirements in confidence to:

Human Resources Division
Connecticut Natural Gas Corporation
100 Columbus Boulevard
Hartford, Connecticut 06103

Equal Opportunity Employer

DESIRABLE SKILLS

- WANG VS
- NOMAD
- IMS DB/DC, PL/1, COBOL
- FOCUS (Mainframe & PC)
- DB2/SQL, TELON
- AS Programmers
- IDMS ADSA

Morris Information Systems
4086 East Oak Place Dr.
Suite 200
Houston, TX 77027
(713) 840-7771

Florida Opportunities

Top quality Florida companies have the following needs:

Project Leader with 3+ years IDMS/ADSO

PA with MSA Payroll or GL experience.

Sr. PA/BA with strong System 38, Cobol and RPG Degree required.

PA to Sr. PA with 2+ years ADABAS/NATURAL.

PA with Mod 204 experience.

Other opportunities for PAs with IBM, Cobol and CICS.

Companies pay interviewing costs, relo expenses, excellent benefits.

Send confidential resume or call Management Resources Of St. Petersburg, 7001 4th St. N, Suite 207, St. Petersburg, FL 33702. (813) 577-2110

FLORIDA

PA-SAS	to $35K
PA-"C"	to $35K
Tech Mgr-VAX/VMS VMS	to $45K
PA-Micros, BASIC, DBASE	to $30K
DBA-IMS	to $42K
PA-PASCAL- VAX VMS	to $40K
PA-CICS	to $38K
Pjt Mgr - retail, POS	to $50K
Sys Admn-VAX/VMS	to $40K
DBA-IDMS	to $45K
Sys Prog - CICS	to $42K
Sys Prog - Sys 38	to $35K
DBA - Datacom	to $40K
Sys Anal-DPS/8, DMIV	to $48K
PA- FLA software	to $35K
PA-Sys 38	to $35K
Mgr Datacomm-banking	to $55K
Sys Prog-ADABAS DOS/VSE	to $45K
DP Mgr-Sys 38	to $45K
PA-Burroughs, banking	to $30K
SA-ADABAS, NATURAL	to $40K
PA-Tandem, TAL	to $37K
SE-UNIX, KERNEL	to $65K
Sys Prog-WANG/VS	to $55K
Voice Comm Specialist	to $50K

Contract and permanent positions in Florida and the Southeast.

COMPUTERPEOPLE

12225 28th Street North
St. Petersburg, FL 33702
(813) 576-2878
or
2005 W. Cypress Creek Rd.,
Suite 3, Ft. Lauderdale, FL 33309
(305) 771-8803
eoe m/f

Manager Of Computer Applications

Immediate opening for an achievement oriented individual in a pulp mill located in coastal Georgia, between Savannah and Jacksonville. Many phases of development will challenge a professional talent with heavy DEC/VAX experience.

Management and coordination responsibilities will include working with users, decision-makers, and implementors to achieve a state of the art environment through such projects as:

* Implementation of databases to support a mill-wide information system
* Coordination of support for a mill tracking system
* Support for professional engineering staff's applications
* Integration of IBM System/38 with a VAX network

We seek a degreed individual who works well with people, from top management to production personnel. Project management will provide the right person with a great deal of latitude and job satisfaction.

Send your resume in confidence to CW-B4878, Computerworld, Box 9171, Framingham, MA 01701-9171

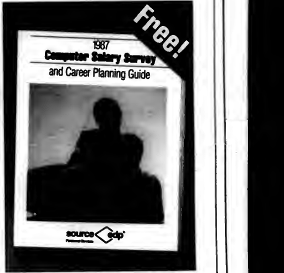
EOE M/F H/V

PROGRAMMER BASIC 4 - BUSINESS BASIC P/A --$30-40,000--

Rapid expansion has created this upwardly mobile career opty. Strong BASIC 4 & Business Basic skills are the pre-requisites for consideration at this multi-level software house. High degree of visibility. Fee Paid!

ROBERT HALF OF NEW YORK, Inc.
522 Fifth Avenue
New York, NY 10036
212-221-6500

Keep yourself up-to-date on salaries and careers in 1987



Understanding which technologies and markets are on the rise and which are on the wane can be important to your long-term career growth. If you keep up with new trends and tailor your professional plans accordingly, you can make sharp gains in your compensation and career.

Comprehensive data on industry trends and salaries

The new **1987 Computer Salary Survey and Career Planning Guide** is based on information from thousands of computer professionals and firms across North America. Over sixty position titles are reviewed including those in programming, systems analysis, software engineering, Edp auditing, office automation, operations, computer sales, marketing, technical support, management and more.

You'll learn whether your salary is keeping pace with your peers, what you can expect to earn as you advance, and how to direct your career by taking advantage of emerging trends.

Free to computer professionals

This valuable 24-page Survey is available without charge. Since 1966 we have distributed almost one million copies to other professionals like you who are determined to realize their fullest career potential. You owe it to yourself to be informed. Contact us today.

Call your nearest Source® office for a new, free Survey

United States:	
Alabama	
Birmingham	205/322-8745
Arizona	
Phoenix	602/279-1010
Tucson	602/792-0375
California	
Northern	
Mountain View	415/969-4910
Sacramento	916/446-3478
San Francisco	415/434-2410
Silicon Valley	408/737-2424
Walnut Creek	415/945-1910
Southern	
Fullerton	714/738-1313
Irvine	714/660-1666
Los Angeles	
Downtown	213/688-0041
South Bay	213/540-7500
West	213/203-8111
San Diego	619/573-0160
San Fernando Valley	818/995-1900
Colorado	
Colorado Springs	303/632-1717
Englewood	303/773-3700
Connecticut	
Danbury	203/797-4990
Hartford	203/522-6590
New Haven	203/787-4595
Stamford	203/967-4800
Stratford	203/375-7240
Waterbury	203/574-6630
Delaware	
Wilmington	302/652-0800
District of Columbia	
Washington D.C.	202/293-9255
Florida	
Fort Lauderdale	305/491-8145
Jacksonville	904/396-1920
Melbourne	305/725-3665
N. Miami Beach	305/949-1014
Orlando	305/282-9455
Pinellas	813/443-6400
Tampa	813/222-0097
Georgia	
Atlanta/Downtown	404/588-9350
Atlanta/North	404/953-0250
Atlanta/Perimeter 400	404/255-2045
Illinois	
Chicago/Loop	312/372-1900
Oak Brook	312/986-0422
Peoria	309/673-0274
Rolling Meadows	312/392-0244
Indiana	
Fort Wayne	219/432-7338
Indianapolis	317/631-2900
Iowa	
Des Moines	515/243-0191
Kansas	
Overland Park	913/888-8885
Topeka	913/232-6722
Wichita	316/688-1621
Kentucky	
Louisville	502/581-9900
Louisiana	
New Orleans	504/561-6000
Shreveport	318/222-6185
Maryland	
Baltimore	301/727-4050
Beltsville	301/595-4004
Columbia	301/730-6833
Greenbelt	301/441-6700
Rockville	301/258-8800
Towson	301/321-7044
Massachusetts	
Boston	617/482-7613
Burlington	617/273-5160
Salem	603/893-7311
Springfield	413/739-4083
Wellesley	617/237-3120
Michigan	
Detroit	313/259-7607
Grand Rapids	616/459-6538
Lansing	517/484-4561
Southfield	313/352-6520
Troy	313/362-0070
Minnesota	
Bloomington	612/835-5100
Minneapolis	612/332-6460
St. Paul	612/227-6100
Missouri	
Kansas City	816/474-3393
Clayton	314/862-3800
St. Louis, Westport	314/576-4444
Nebraska	
Omaha	402/346-0700
New Hampshire	
Nashua	603/880-7650
New Jersey	
Atlantic City	609/345-2444
Cherry Hill	609/488-5400
Clifton	201/473-5400
Edison	201/494-2800
Morristown	201/267-3222
Paramus	201/845-3900
Princeton	609/452-7277
Somerset	201/469-9444
New Mexico	
Albuquerque	505/247-4270
New York	
Albany	518/482-2036
Binghamton	607/722-1345
Buffalo	716/855-0400
New York City	
Grand Central	212/557-8611
Penn Station	212/736-7445
Wall Street	212/962-8000
Rochester	716/263-3870
Syosset, L.I.	516/364-0900
Syracuse	315/422-2411
White Plains	914/694-4400
North Carolina	
Charlotte	704/552-6577
Greensboro	919/379-1155
Raleigh	919/847-7805
Winston-Salem	919/724-0830
Ohio	
Akron	216/535-1150
Cincinnati	513/769-5080
Cleveland	216/771-2070
Columbus	614/224-0800
Dayton	513/461-4660
Toledo	419/242-3871
Oklahoma	
Oklahoma City	405/722-7410
Tulsa	918/599-7700
Oregon	
Portland	503/223-6160
Pennsylvania	
Allentown	215/776-0524
Harrisburg	717/761-8790
King of Prussia	215/265-7250
Philadelphia	215/665-1717
Pittsburgh	412/261-6540
Reading	215/374-4230
Scranton/Wilkes-Barre	717/655-6464
Rhode Island	
Providence	401/751-0065
South Carolina	
Columbia	803/256-7446
Greenville	803/271-7044
Tennessee	
Chattanooga	615/266-6880
Memphis	601/525-0740
Nashville	615/256-0625
Texas	
Austin	512/472-0100
Dallas	
Central	214/954-1100
North	214/387-1600
Northeast	214/680-1100
El Paso	915/532-4316
Fort Worth	817/338-9300
Houston	
Downtown	713/751-0100
San Antonio	512/656-0100
Utah	
Salt Lake City	801/966-3000
Virginia	
McLean	703/790-5610
Washington	
Seattle	206/454-6400
Spokane	509/838-7877
Wisconsin	
Green Bay	414/432-1104
Madison	608/251-0104
Milwaukee	414/277-0345
Canada:	
Alberta	
Calgary	403/279-1940
Edmonton	403/459-1153
British Columbia	
Vancouver	604/222-1156
Manitoba	
Winnipeg	204/942-1151
Ontario	
Mississauga	416/848-3344
Toronto	416/591-1110
Willowdale	416/495-1551

source edp® Personnel Services — The world's largest recruiting firm devoted exclusively to the computing profession. Client companies assume our charges.

Department 708, P.O. Box 7100, Mountain View, CA 94039
(When writing, please include your title.)

TOP DRAWER

DATA SECURITY ADMINISTRATOR
ACF 2, RACF, TOP SECRET

PROJECT LEADER—IMAGE PROCESSING
VAX, UNIX, C, MICROPROCESSORS

LEAD PROGRAMMER/ANALYST
VAX 8200, COBOL/BASIC

SR. PROGRAMMER/ANALYST
DGMV 10000, AOS/VS, INFOS II

BRUCE A. MONTVILLE, Managing Partner — TOLL FREE (800) 258-7328

EXETER 2100™
COMPUTER TECHNOLOGY RECRUITING CONSULTANTS
Computer Park, Box 2120, Hampton, NH 03842/(603) 926-6712

1000 DP Opportunities

[illegible]

Rick Young, CPC (704) 366-1800
Corporate Personnel Consultants, Inc.
[illegible]
Charlotte, N.C. 28211

System Developers 800-231-5920

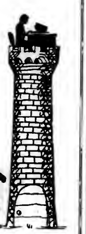
Seeking resumes from individuals in the more highly technical computer related positions such as: PhD Computer Scientists, Operating System Developers, Data Base Developers, Parsing Specialists, Networks and Telecommunications, Architecture, Artificial Intelligence, Graphics Systems Developers, Microcode and Firmware Developers, Compiler Development, etc. Special interest in emerging technology such as novel architectures, UNIX, ADA, etc. Similar interest in scientific applications developers including military, process control, data acquisition, telemetry and communications, CAD/CAM, simulation and modeling, etc.—we are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call D.A. Nadeau and ask for our free [illegible] & career planner.

Scientific Placement, Inc.
P.O. Box [illegible] Houston, TX [illegible] 713-[illegible]
UNIX is a trademark of Bell Labs

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

Tax Laws Putting The Squeeze on You?

Let Knight Rescue You.



We can offer personal service that sets the industry standard, to experienced Contracting Professionals who have lost their independent status due to the tax law changes. Our crack sales staff can offer you the choice of:

- Negotiating a third party relationship with your current client to enable you to continue your current project as our employee.
- Using our marketing contacts with top Fortune 500 companies, developed since our founding in 1972, to market you for new positions nationwide as our employee.

In either case, upon placement you will receive the administrative support you deserve. Benefits include all company-paid insurances, relocation assistance and more. All Systems Professionals are invited to call Lisa Cohan collect at: (212) 365-7760, or send a resume in strictest confidence, to:

KNIGHT PROGRAMMING SUPPORT
800 Third Avenue, New York, New York 10022, USA
New York • San Francisco • London • Manchester
Birmingham • Amsterdam • Brussels • Frankfurt

American Re, a leader in the reinsurance industry, is moving its corporate headquarters currently across from the World Trade Center to a new facility in Princeton, in mid 1988. We currently have an opening for a

Director, Technical Services

We seek a dynamic manager for our state-of-the-art VM/VSE system. You will be responsible for managing 9 systems programmers, working with VM, VSE/SP, VTAM and CICS. You will be accountable for:

- ☐ Planning and coordinating a Nationwide SNA Network
- ☐ Planning and coordinating an International X 25 Network
- ☐ Integrating Wang VS, IBM VM/VSE, and IBM PC's
- ☐ OEM software integration
- ☐ Hardware and Capacity Planning
- ☐ Implementing Information Center Environment.

Candidates must have proven management experience in systems programming, with 6 years DOS/VSE and CICS, 2 years VM and VTAM.

If you want to be part of this challenging, fast moving team send your resume with salary history to: **Ken Greenberg, Recruitment Supervisor, Department #0126/CW/DTS.**

American Re-Insurance Company
One Liberty Plaza, 91 Liberty Street
New York, New York 10006
An equal opportunity employer

```
if ( GURU=$you )
then
  echo $you " resume ---> LAI"
fi
```

LAI is a computer consulting and software development firm with immediate openings for senior level computer scientists. Headquartered in the Chicago area, opportunities exist in Chicago, Columbus and other locations.

Specific project work includes:

- UNIX® operating systems security, utilities & kernel enhancements. Real-time software design & development.
- Telephony (ISDN, #5 Switch, OSPS, & CCD) Call processing software design & development, system integration & testing.
- Communications (SUN's NFS®, AT&T's RFS®, X.25, & TCP/IP) ETHERNET, OSI & LAN protocols.

Qualified candidates must have 2-5 years of experience in one or more of the preceding areas and a master's degree or equivalent in computer science.

We offer competitive salaries and a comprehensive benefit package. Send resume to:

Lachman Associates, Inc.
1901 N. Naper Blvd.
Naperville, IL 60540
Attn: Staffing-CW
or
UUCP: ..ihnp4!laidhak!jobs

Equal Opportunity Employer
UNIX is a registered trademark of AT&T

HP 3000 NEW DATA CENTER

Our client, a Fortune 200 company, is opening a new state of the art data center in Los Angeles. They are installing 30+ HP 3000 model 68's linked to dual IBM 3090's MVS/XA making it one of the world's largest and technologically advanced distributed processing networks in the world. Current staffing requirements are:

PROGRAMMER ANALYSTS (all levels)
SR. SYSTEMS ANALYSTS
PROJECT LEADERS
DEPARTMENT MANAGERS
SYSTEMS PROGRAMMERS
DATA BASE ADMINISTRATORS
OPERATIONS MANAGERS
TELECOMMUNICATIONS ANALYSTS

The current software environment consists of Image, Query, View, KSAM, Powerhouse, Quick, Quiz, QTP, ASK Software Packages, Speedware, SFO, COBOL, FORTRAN, SPL, BASIC P/C's and other 4th G/L's. Send resume or call:

DAVID JONES & ASSOCIATES
4067 Hardwick Street, Suite 142
Lakewood, CA 90712
(213) 420-3279

SOFTWARE CONSULTANTS

Internat'ly. prominent consulting firm has urgent need for software devel. prof. for assignments w/FORTUNE 100 clients. Req min. 2 yrs. exp. in an IBM environ. Pref. bkgrd. includes PL/1, IMS DB/DC & COBOL. Any DB exp. a plus. Excellent co. offers full benefits & relo. pkg. to Western New York. To $40,000.

ROBERT HALF OF BUFFALO, INC.
420 Main Street
1112 Liberty Building
Buffalo, NY 14202
(716) 842-0801
Personnel Agency

VERMONT

- PROGRAMMERS
- PROGRAMMER/ANALYSTS
- SYSTEMS ANALYSTS
- PROJECT LEADERS
- SYSTEMS PROGRAMMERS

3-5 years Manufacturing, Insurance or Banking experience & IBM 43XX DOS/VSE, 30XX OS/MVS, COBOL, BAL, BASIC, CICS, IDMS, S/36 RPGII, S/38 RPGIII, HP3000, DEC, Datacomm, Lifecomm. Company fee paid. Salaries $18 to 45K plus relocation assistance. Please send resume in confidence to:

SAUDI ARABIA

A leading Saudi Oil and Mineral company invites applications from senior professionals for the position of:

SUPERVISOR PROCESS ANALYSIS AND ECONOMICS

Responsibilities will include: implementation and improvement of flowsheet simulation packages within ROSS (support to oil refineries modelling, simulation debottlenecking and troubleshooting studies).

The successful candidate will hold a M.Sc. degree (or equivalent) in Chemical Engineering and will have specialized practical experience (minimum of 5 years) in the use of process simulation packages, such as PROCESS, CHEMSHARE.

Experience is also required (minimum 2 years) in the design and development of mathematical models for distillation systems, thermodynamics and vapourliquid equilibria, convergence promotion techniques, etc.

Technical skills in process operation of an oil refinery and fortran programming are essential.

Salary and benefits (housing, personal car, children's school fees, medical assistance, etc.) are comparable with the standard international level. Employment sited in a fully developed town.

Applications in duplicate with full personal, educational and professional details to be submitted to...

Miss M.A. Merron
M.S.J.V.,
c/o IPCO INTERNATIONAL Ltd.,
Suite 30, 140 Park Lane
London W1Y 3AA

☐ **Full Service** ☐☐☐☐☐☐
☐ **Data-Processing** ☐☐☐☐☐
☐ **Placement** ☐☐☐☐☐☐☐
☐ **Companies.** ☐☐☐☐☐☐☐

Specializing in the Placement of:
- Systems Programmers
- Managers
- Programmer/Analysts
- Systems Analysts
- Data Communications
- Operations
- Software Engineers
- Scientific Programmers

☐☐☐☐☐ **ALL FEES COMPANY PAID** ☐☐☐☐☐

☐ Target Search, Inc.
7658 Standish Place
Suite 105
Rockville, MD 20855
(301) 340-7005

☐ Computer People, Inc.
Park National Bank Bldg
5353 Wayzata Blvd. Suite 604
Minneapolis, MN 55416
(612) 542-8520

☐ EDP Professionals
305A Fairview Plaza One
Charlotte, NC 28210
(704) 554-1101
(704) 554-1102 (Modem)

Certified Grocers Of Florida, Inc. Has Immediate Opening For A Programmer/Analyst.

Certified Grocers Of Florida, Inc., located in Ocala, Florida and one of Marion County's leading employers has an immediate opening for a Programmer/Analyst in its Information Systems Division. A minimum of four years of experience is required in DOS/VSE, COBOL, COMMAND CICS along with Inventory or Financial Background. Salary is 22-32K range depending on experience. Excellent benefits package including profit sharing. For immediate interview send your resume to **David Dillman, Manager, Human Resources, Certified Grocers Of Florida, Inc., P.O. Box 1510, Ocala, FL 32678.**

Certified Grocers Is An Equal Opportunity Employer

HELP WANTED: System Software Engineer

PLEASE SEND RESUME TO:

EMPLOYMENT SECURITY DEPARTMENT ES DIVISION, ATT: AEC # [illegible] OLYMPIA, WA 98504

JOB DESCRIPTION: System Software Engineer, Applications Group. Designs, implements, and tests complex and high level systems and software for mini and micro computers and processors. Works with other engineers to design critical software utilizing C and Assembly languages. Will work with Intel 8080/8086 family of microprocessors. Utilizes Artificial Intelligence technology to design tools for applications software. Adapts single-user applications software to a multi-user environment. Assumes major project responsibility including: 1) requirements and analysis of project specifications; 2) product design; and 3) implementation schedules.

REQUIREMENTS: B.A. or B.S. in Mathematics, Computer Science, Electrical Engineering or Physics. Computer software design or programming: 6 months' employment experience utilizing C and Assembly languages, and Intel 8080-8086 family of microprocessors and designing multi-user software.

SALARY: $27,000 per annum. Position located in Redmond, Washington. EOE.

DATA METHODS ANALYST

for computer software services firm in N.E. Ohio. Will analyze client management's data processing requirements & recommend electronic data processing system that best fits needs, recommend computer software, hardware and/or mathematical solutions, plans layout of new system installation or modification of current system. Requires MBA in Management Information Systems. Academic program must have included at least 1 of each of following courses: Computer Tech. for Managerial Problem Solving, Decision Support System for Planning & Budgeting, Advance Programming Tech (COBOL), Data Base Management, and course or courses covering following computer programming languages: BASIC, COBOL, C, IDMS DB/DC, ADS on line, CICS, and DOS, MVS, VSAM, D BASE III, and FMS Software Products. No experience required. 40 hr wk. $29,000/yr. Send resume with this ad to L. Ellison, JO #3025798, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216.

Systems accountant, 40 hours per week, 9:00 A.M. to 5:00 P.M., Monday through Friday, $22,000.00 per year. Conducts financial audits of the company's clients by reviewing and evaluating accounting systems, applying generally accepted auditing standards and accounting principles. Also reviews and evaluates EDP systems, utilizing various computer hardware, which varies from client to client, and using computer languages including COBOL, PL/C, FORTRAN, SPSS, IDA SOL/DS, MINITAB and EMPIRE. Uses and develops software for micro-computer processing. Based on these evaluations, recommends changes in accounting and EDP systems and related procedures. Applicant must have a BS degree in Quantitative Methods and Accounting and must have taken a course in each of the following: Administration of management information systems, Business systems simulation, Business computer technology, and Business information systems, (also called Business Systems Design).

Send resumes to: Illinois Job Service, 910 South Michigan Avenue, Room 333, Chicago, Illinois 60605 Attention: Robert E. Fallon, Reference #V-IL 5916 F, An Employer Paid Ad

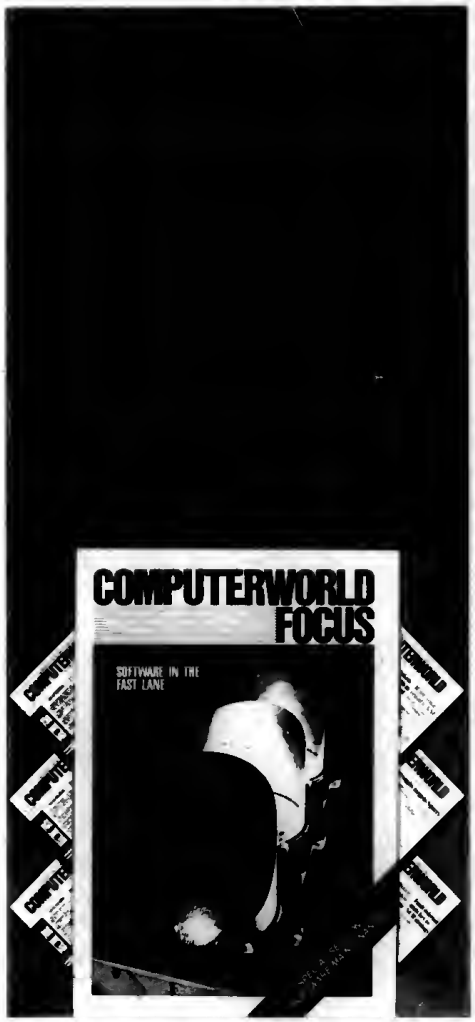
---

Software Engineer

40 hrs. weekly, 9:00 A.M. to 5:00 P.M. $27,000.00 yearly. 1) Write and debug word processing file translation software for IBM PC-XT, Microvax II and Onyx Computers and various types of word processors. 2) Maintain Engineering Change Request (ECR) and maintenance list for all products. 3) Port product source code and adapt source code to various mini and microcomputer operating system and hardware environments using C and assembler programming languages and Unix, VMS and MSDOS operating systems. 4) Evaluate word processing systems with respect to document structure normalization. Bachelor of Science degree in Engineering required. Must be able to use C and Assembler programming languages and Unix, VMS and MSDOS operating systems. Must be versed in the operation of stand alone and PC-based word processors. Send resumes to: ILLINOIS JOB SERVICE, 910 South Michigan Avenue - Room 333, Chicago, Illinois 60605. Att: Marla Rinneman. Ref#V-IL [illegible]. AN EMPLOYER PAID AD.

PROGRAMMER ANALYST

- responsible for analysis, design, implementation and documentation of new systems or changes to existing systems or batch and on-line environment, using IBM assembler, COBOL (Common Business Oriented Language), CIS (Customer Information Control System) language under large IBM mainframe. May assign projects to others and monitor progress, provides estimates, detailed specifications and recommendations regarding installation of new systems. High School Graduate; 4 yrs college, Bachelor Degree Computer Science; 4 mos experience in job offered; 2 yrs exper. as Programmer. The 4 mos experience must include implementation and use of University Computer company super MICR II (magnetic ink character recognition) systems. Salary $[illegible] per/yr., basis 40 hr. wk. (8-4:30 pm). Send resume: MESC, 7310 Woodward, Rm. 415, Detroit, MI 48202. Ref. No. [illegible]. Employer Paid Ad.


COMPUTERWORLD
FOCUS
SOFTWARE IN THE
FAST LANE

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 55 SOUTHEASTERN, PA 19398

POSTAGE WILL BE PAID BY

CIRCULATION DEPARTMENT

COMPUTERWORLD

P.O. Box 1016
Southeastern, PA 19398-9984

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

TEXAS HILL COUNTRY OPPORTUNITIES

The Continuum Company, the leader in software development for the life insurance industry, is located in Austin, Texas. The Processing Services Division is responsible for providing computing services using IBM's 3084Q and 3090 processors running MVS/XA, VM/HPO, and DOS/VSE, all with access to over 150 gigabytes of DASD. Immediate openings are available for the following positions:

CAPACITY PLANNING MANAGER Manage a staff responsible for all aspects of computer resource capacity, using various planning/modeling tools. Qualified candidates should have strong managerial skills, with a background in large systems capacity planning.

CAPACITY PLANNING ANALYST This position requires a strong background in capacity planning and performance. Minimum 3-5 years experience required. Familiarity with SAS, BEST/1, and CRYSTAL a plus.

SYSTEMS PROGRAMMER This person should have a heavy background in MVS/XA, and JES2 performance and tuning. VTAM background a plus. Minimum 3-5 years experience required.

STORAGE CONTROL MANAGER The best candidate for this position will be familiar with the "DASD pooling" concept, and have strong managerial skills. Previous experience implementing pooling a plus.

STORAGE CONTROL ANALYST Candidates should have experience using DMS/OS for DASD management. This position works closely with users coordinating volume backup, restores, overall allocation, and assist in user problem determination.

COMMUNICATIONS MANAGER This person will manage a staff responsible for all aspects of voice and data communications. This group coordinates the installation and problem determination for over 500 local terminals, 50+ data circuits serving both national and international users, and all Rolm voice equipment. This group also provides a Help Desk which is the first point of contact for all user problems. Strong managerial skills required.

TAPE LIBRARIAN This job required an in-depth knowledge of and actual experience using the UCC1/TMS software product. Qualified candidates must be able to interact with TCC's extensive customer base and able to manage a large library of tapes. Additional project management experience is very desirable. Experience with VM/CMS, BACKUPC, and TAPELIBC would be a plus.

OPERATIONS SHIFT SUPERVISOR Qualified applicants must have experience in managing the shift operations of a large data center with multiple IBM CPUs. Must also have the ability to provide utmost in service to data center customers. Project management experience is a definite requirement. Participatory experience with data center relocation, disaster recovery, and physical planning a very desirable. Shift rotations must not be a problem.

Interested candidates should mail their resumes and salary history (indicating position being applied for) to:

Vice President, Processing Services Division
The Continuum Company
3429 Executive Center Drive, Austin, TX 78731

Principals only please EOE

CICS/IMS/VSAM DP Series

CICS/VS Command Level Programming with COBOL Examples By David Lee $29.95
Used by 15,000 CICS programmers. Considered the best by many DP pros. Presents more examples, sample programs and techniques than the other two CICS books combined. 273 practical examples. 15 most important CICS applications, each is demonstrated by a sample CICS program. CICS mapset coding. Pseudo Conversational CICS program design, coding, testing and implementation. CICS Internal Table Setup, CEDF Debugging, CEMT and CSMT usage. Dump Reading, Production Abend Handling. Online report printing. Menu-driven, Data Entry, Inquiry Update, Browse. VSAM Alternate Index processing, Automatic Task Initiation and much more.

CICS/VS Online System Design and Implementation Techniques By David Lee $29.95
Just published! This book is a must for all CICS programmers and analysts who want to gain 3 years of heavy CICS experience within several months. It contains 4 parts. Part 1 covers CICS advanced features. Part 2 covers CICS design, testing and implementation techniques that you must know to survive in the real-life CICS environment. Part 3 lists 100 most common CICS application problems that a CICS programmer may encounter on a daily basis and their solutions. You can gain a lot of problem-solving experience instantly by having this list. Part 4 presents 15 most important CICS applications, each is demonstrated by a sample CICS program.

IMS/VS DB/DC Online Programming Using MFS and DL/I By David Lee $29.95
Published in '85. Used by 6000 IMS DB/DC programmers and adopted by AT&T. The only complete and practical IMS VS DB DC programming guide in the market. 245 practical examples. Nine major IMS DB DC applications are presented. MFS format coding, MPP program design, coding, testing and implementation. BMP programming, BTS II Testing. Production Abend handling, and much more!

IMS/VS DL/I Programming with COBOL Examples By David Lee $29.95
This book covers all the basics of DL/I data base and DL/I batch programming with introduction to IMS DB DC online programming. 212 practical examples. 10 major IMS/VS applications. DL/I data base concepts. DL/I call usage. DL/I batch program design, coding, testing and implementation. DL/I JCL setup. BTS II Testing. Data Base Access Methods. DBDGEN and PSBGEN utility usage. Data base load. Logical Data Base and Secondary Index design and processing, and much more!

VSAM Coding in COBOL and VSAM AMS By David Lee $19.95
Become a VSAM expert in just one month! A practical guide for COBOL programmers using VSAM files. Fourteen major VSAM applications written in COBOL. 53 AMS examples to cover all types of VSAM file creation and maintenance. Many practical COBOL examples, and OS/VS or DOS/VS JCL on VSAM files. $17.95 copy (4 or more)

Order Your Copies Today! To order by credit card (VISA or M/C), call TOLL FREE 1-800-851-5972 or 214-248-7642 (in Texas). To save S&H charges, send $29.95/copy or $24.95/copy (4 or more copies) to the address below. Allow 1 to 2 weeks for delivery.

Unlimited Guarantee: Full Refund At Any Time If Not Satisfied.

CCD ONLINE SYSTEMS, INC.
TOLL FREE 1-800-851-5972
10080 Dallas Parkway, Suite 151, Dallas, TX 75248

data processing

PROGRAMMER/ANALYST

Zimmer, Inc. is an innovative leader in the design, manufacture and marketing of orthopaedic products, and a growth-oriented division of Bristol-Myers Company. We currently seek a Programmer/Analyst with 2-5 years experience, preferably in a healthcare environment, as well as knowledge of MVS, TSO, JCL and COBOL. College degree desirable.

Enjoy an excellent salary/benefits package, a dynamic working environment and the unique lifestyle and recreational activities of northern Indiana. For immediate consideration, send your resume to: **Kenneth P. Kelley, ZIMMER, INC., div. Bristol-Myers Company, P.O. Box 708, Warsaw, IN 46580.** An Equal Opportunity Employer M/F/H/V

zimmer
WARSAW, INDIANA 46580

HOW TO GET SPECIAL PROJECTS DONE WITHOUT TYING YOUR STAFF IN KNOTS.

Now you can get your special data processing projects completed quickly, accurately and cost-effectively without disrupting the workflow of your organization. The solution is project-oriented specialists from Accountemps.

Accountemps data processing professionals are slightly overqualified. Orientation is short and simple. They fit in with your permanent staff and have the expertise to complete special projects knowledgeably and skillfully. You supervise them just like you do your own people. And you don't have to divert your permanent systems analysts, programmers, operators, and data entry personnel from their regular assignments.

The result is that you meet your deadlines, get a professionally done job and save time and money.

Call us the next time you have a special project. We'll send you a data processing specialist, or a team of specialists to pitch in for a day, a week, a month or longer.

Rely on Accountemps.
You'll be glad you did.

accountemps.
data processing
Rent an Expert.

© 1986, Robert Half International Inc.
Offices independently owned and operated.

DIRECTOR OF INFORMATION SERVICES

This executive position with the City of Colorado Springs, Colorado, reports to the Deputy City Manager/Administrative Services. Through a staff of 97 and a budget of $7.3 million, directs the City's information processing program in order to support the planning, prioritizing, development and implementation of information systems and the operation of central and distributed computer processing centers and telecommunications networks. Requires a Bachelor's degree; a minimum of 3 years experience as a director/manager of an information processing department; or an equivalent combination of education and experience. Master's degree in Computer Science, Management Information Systems, or Business Administration; and/or experience in the utility business systems desirable. SALARY: $44,532-$66,804. Send resume to City of Colorado Springs, Dept. of Personnel, Attn: Employment Manager, P.O. Box 1575, Colorado, CO 80901 by February 20, 1987. An Equal Opportunity/Affirmative Action Employer.

Data Processing Professionals

A unique opportunity exists to join the world's largest winery in responsible career growth positions offering an excellent compensation/benefit package and ideal living conditions in a nonmetropolitan area 90 miles from San Francisco.

We are seeking experienced MVS professionals for design, development, operations and technical support. These are premiere opportunities to be involved in redesign/rewrite of major systems such as Order Entry, Sales, Pricing, Trucking and Health Insurance in the following environment:
Hardware: IBM 3090-150. Systems software: MVS/XA, CICS, DB2, TSO/E, RACF. Development software: QMF, CSP, AS, COBOL, FOCUS and Structured Design Tools.

Please send resume and salary history in confidence to: **Professional Staffing Department, E. & J. Gallo Winery, P.O. Box 1130, Modesto, CA 95353.**

E. & J. GALLO WINERY

An equal opportunity employer m/f/h

DATA PROCESSING PROFESSIONALS

TECHNOLOGY IN TOLEDO

IT'S A WHOLE LOT MORE THAN YOU THINK.

We're serious. We're Blue Cross and Blue Shield of Ohio, a state-of-the-art leader in the health insurance industry. And we're ready to offer Data Processing professionals tremendous growth opportunities and challenges working in one of the most technologically advanced systems anywhere. Right now, we're taking an aggressively competitive posture and we need talented, energetic individuals who want to grow with us. We can promise you a stimulating working environment where management cares about your ideas, and you

We currently have openings for professionals who have a Bachelor's degree in Computer Science or a related field, or related experience, to work in the following areas:

Telecommunications Analyst

Responsible for the design, selection, acquisition and installation planning of voice/data networks. Requires a minimum 3 years' experience with sophisticated voice/data systems using various telecommunications equipment. Demonstrated ability to evaluate, design, plan and install systems hardware.

Data Base Analyst

Provides support to Applications staff in maintaining a large and complex IMS environment. A minimum 2 years' data base administration experience in an IMS/DB/DC environment working with all IMS support activities, including IMS logical data base structures and data base performance considerations, is necessary. Working knowledge of VSAM, plus IMS support facilities, such as BTSII, SMUII and MPS is important. DBRC experience is also desirable.

Associate Technical Specialist/ Data Base

Responsible for the operational support of data storage and retrieval. A minimum 1 year system programming or data base analysis experience in an IBM mainframe environment is required. Prior programming in an on-line, data base environment, plus knowledge of data access methods, such as VSAM, QSAM and Assembler language, are necessary. An understanding of backup and recovery, reorganization, data access, problem determination and resolution, security and data integrity is important. This position will include learning to tune the IMS environment.

Our state-of-the-art facilities are located in suburban Toledo, Ohio, an exciting midwestern community offering affordable housing and excellent school systems.

We offer competitive starting salaries and outstanding benefits, including tuition reimbursement, matched savings 401K retirement plan, free parking and the full medical coverage you would expect from an insurance leader. Send resume, including salary history, to: Human Resources Department, Blue Cross and Blue Shield of Ohio, 3737 Sylvania Ave., Toledo, OH, 43623. An Equal Opportunity Employer

Blue Cross Blue Shield Of Ohio

Data Processing

Systemhouse

There's never been a better time to join us in:

Honolulu, HI · **Salt Lake City, UT**
Topeka, KS · **Phoenix, AZ**
Olympia, WA · **Anchorage, AK**

Systemhouse is one of the largest and fastest growing systems integrators in the industry. By applying leading technologies to information problems, we've delivered some of the most complex and successful systems solutions to our clients.

Our dynamic growth has created opportunities for experienced and highly motivated professionals in the following areas:

Technical Consultants
Systems Analysts
Programmer Analysts

Requirements include experience in one or more of the following:

IBM · BURROUGHS

Also required is experience in one or more of the following:

ADABAS NATURAL LINC COBOL CICS

Additional experience in any of the following areas is highly desirable:

Mini/Micros
Communications Protocols
Distributed Processing
Welfare Systems

All positions require relocation for 12-18 months.

For immediate consideration and to arrange an interview, send your résumé in confidence to:

Beth Jenkins
Systemhouse Inc.
National Systems
Suite 500, Dept. CW-2
1655 N. Fort Myer Drive
Arlington, VA 22209

An Equal Opportunity Employer.

SYSTEMS ANALYST

Solano County MIS is seeking an experienced systems analyst to work on a variety of applications. A minimum of three years experience in programming is required, one of which must have been at the programmer analyst level. A solid background in systems analysis, design, and programming is required. A four year degree in computer science, business administration, or public administration is desirable. Our network includes IBM 4331, HP3000, HP1000, and microcomputer equipment. We have an aggressive automation policy which best fits hard-working self drivers who enjoy a team environment.

Sal $29,566 - $35,934 per annum. The anticipated July 1, 1987 annual salary will be $33,240 - $40,423. Final filing date for applications and resume is 2/27/87. For an application and brochure contact:

Doug Darling
Solano County Personnel Dept.
601 Texas St.
Fairfield, CA 94533
(707) 429-6321

MAJOR EXPANSION

Over a three year period this company has grown from a new start-up to an astounding 125 in DP. An additional 12 people will be added throughout 1987. Ranked #1 as the highest paying and fastest growing company in its industry, not to mention such perks as R.E. fees, savings plans, dental and many more. Requirements include a minimum 2 yrs. experience as a PA, SA, or SP on a large IBM mainframe. Need any 2 of the following: COBOL, CICS, IDMS, IMS, MSA, or COMSERV.

If you are serious about a career move, it would be in your best interest to exclusively contact an agency that is well established, member of a national network, and will give your career interests top priority. No obligations! *Please write or call Robert Montgomery collect at 919-787-4888.*

The Data Group
P.O. Box 52055
Raleigh, NC 27612

Programmer Analyst

to analyze business procedures and problems to refine data and convert to programmable form for electronic data processing. Must ensure system security. Plans and prepares special studies and investigations pertaining to development of new information systems and relational Main Frame and PC data bases. Must be able to use DBASE III, RBASE 5000, Q & A, APL, SAS, Tellagraf as well as analyze other computer language. Will troubleshoot. Responsible for design and implementation of data-based systems. Will train users of systems and applications and give technical assistance. Will evaluate use of new software products and advise clients. Involved with BETA Testing of new products. Plans and prepares reports, memoranda and instructional manuals. Bachelor or Post Bachelor Degree in Computer Science with one year experience required. Salary $32,000 per year. 40 hour week. Hours 8am-4pm. Send resumes to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference # 78386. Employer paid ad.

HOGAN PROGRAMMER ANALYST

One of the leading Savings & Loan Associations in the Southeast, located on Florida's West Coast, has an opportunity for an individual with 1-3 years HOGAN deposits or loans programming experience. Send resume with salary requirements to:

FLORIDA FEDERAL SAVINGS & LOAN ASSOCIATION
P.O. Box 1509
St. Petersburg, FL 33731
Attn: Sandra Griffin

Equal Opportunity Employer M/F

Systems Software Engineer

The Miami Valley Regional Transit Authority (RTA) of Dayton, Ohio has an immediate opening for a Systems Software Engineer.

Successful individual will have responsibility of providing technical support within the MIS department. Candidates must have at least two to five years Cobol programming experience with Digital equipment, technical applications in a VAX/VMS computer environment. Applicable experience should include in-depth knowledge of VMS operating system, layered products set, and an understanding of VAX cluster configuration and control.

In addition to a challenging career opportunity the RTA offers a competitive salary and an excellent benefits package. Interested candidates should submit a resume and salary history no later than February 9, 1987 to:

Personnel Administrator
Miami Valley
Regional Transit Authority
600 Longworth Street
Dayton, Ohio 45401

An Equal Opportunity Employer

CONSULTANTS/CONTRACTORS/PERMANENT

IG Systems Inc. and its Texas affiliate, CW Systems Inc., have immediate openings if you have experience in the following areas:

ADABAS	C-Language
IDMS	CDC Cyber 180
IMS	SNA
DB2/SQL	UNIX
CICS	DEC VAX 11/75

or application experience in:

Gas Accounting
Point of Sale
Life-Comm/Life 70

Please call or write:

CW Systems Inc	IG Systems Inc	IG Systems Inc
300 West 5th Street	3345 Wilshire Blvd	1301 Shoreway Road
Suite 936	Suite 501	Suite 200
Austin, Texas 78701	Los Angeles, CA 90010	Belmont, CA 94002
512-469-0245	213-386-0400	415-591-5736

NEW ENGLAND

We have specialized in MIS/EDP professional placement for almost a decade. If you strongly desire New England and have experience in large scale IBM environments, contact us for a personalized assessment of career opportunities.

BATTISTA ASSOCIATES
303 Congress St., Suite 800
Boston, MA 02210
(617) 948-7874

Information System Programmer

Develop & write natural & artificial lang. computer programs to locate & retrieve utility customer & billing data & info. Write programs for classification, indexing, input, storage & retrieval, display devices & interfacing w/other systems equip. Devise sample input. Correct program errors. Confer w/info scientist. Requires B.S. in Computer Science/Information systems and 6 mo. Experience. Use of PASCAL, C, or FORTH; multi-tasking operating systems in systems programming, and MS-DOS for IBM-PC. Sal: $22,000 yr. Job site & interviews, Spokane, Wa. Send resumes to: Empl. Sec. Dept. ES Div. Attn: AEC#45759, Olympia, Wa. 98504 not later than Feb. 23, 1987.

CICS, IMS, IDMS SunBelt/National Opportunities

Let us assist you in finding that career advancement opportunity by sending your resume. All fees company paid with salaries in the $25-60,000 range. If you're an experienced EDP professional, contact us today.

Western Technical Careers, Inc.

Programmer to program EDP task related systems. Requires Bachelors or equivalent (nine months professional experience is equivalent to one year of undergraduate education) in Data Processing or Computer Science. Requires two years experience including PL/1 or COBOL, ADABAS, NATURAL, and JCL. Salary is $26,400 per annum. Job El Segundo, California.

Resume to CW-B4875,
Computerworld, Box 9171,
Framingham, MA 01701-9171

BANKING PROGRAMMERS

Tennessee bank has various COBOL positions: CPCS, loans, stock trusts, investments. Also Assembler positions: credit card, CIS. 3 years + experience. Salary to low $30's.

Contact Mike Denison:

2720 Stemmons Frwy. 1207C
Dallas, TX 75207 (214) 637-6360

DATA PROCESSING CAREERS, Inc.

PROGRAMMER/ANALYST -- Resp for setting up computer hardware, selecting & eval software & developing programs for Claims Dept using DBASE III. Resp for modifying & maintaining existing programs util COBOL, C, JCL, PASCAL, DOS, OS/MVS & VM/CMS on IBM PC. $29,500/yr, 40 hrs/5 days/wk. Req'd: Master's - Comp Sci., 3 mos exp or 3 mos rel exp - programming. Send resume to: NYS Job Service, order #NY8021534, 97 - 45 Queens Blvd, Rego Park, NY 11374, DOT code 012.167.066.

PROGRAMMER-RPGII, COBOL

Rural setting, all sorts of outdoor recreation awaits you at this shop. What they need is a Prog. to design and code RPGII and COBOL Systems applications on an IBM 43XX host. Must be able to work independently. Any exposure to CPG a plus. Salary to $25,000.

ROBERT HALF
DATA PROCESSING
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

ACP/PARS Programmer for airline control program (ACP) operating system, using IBM hardware. Uses knowledge of system capabilities & symbolic logic to develop program steps. Performs testing to solve problems. Writes new software for passenger airline reservations system (PARS). Prepares written instructions to guide users, including reports of of program modifications. Places system on line after completion of testing. Uses recoup technique to manage pools of data records. Performs duties using IBM Assembler & PL-1 languages. Must have minimum B.Sc. in Computer Science or Engineering or three years ACP/PARS exp. Hours Mon-Fri 730am-4pm. Salary $2,100/month to $3,000/month according to applicant's skills. Send resume only to Job Service Of Florida, 1350 N.W. 12th Ave., Rm. 280, Miami, FL 33042. Ref: Job Order # FL4549579.

OREGON OPPORTUNITY

Rogue Valley Medical Center, a regional medical center serving southern Oregon and northern California, seeks RPG II Programmer/Analyst with minimum two years experience for growing data processing department. Position requires knowledge of the IBM S/38 and its operating system. Some supervisory experience and BS in Computer Science preferred.

Contact Personnel
Rogue Valley Medical Center
2825 Barnett Road
Medford, Oregon 97504
(503) 770-4343 EOE

STEP-UP YOUR STAFF IN THE CLASSIFIED PAGES OF COMPUTERWORLD

Call 800-343-6474
(or 617-879-0700)
for more information

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

PROGRAMMER/ANALYST

Under general direction, provides support to MIS staff in the areas of systems software support, problem resolution, new version test and migration, quality assurance, systems configuration, etc. Involves extensive interaction with systems programming, operations, and user, application development, and vendor staff. Provide, as a member of the Technical Support team, operational support for a number of IDMS/DC on-line systems which may occasionally necessitate working outside the 9 to 5 timeframe.

Performs self-assigned tasks including but not limited to, development of overall systems design specifications, design and code key modules and sub-systems, monitor system performance, develop quality assurance procedures and testing facilities, evaluate and recommend software tools, work with project leaders and other technical staff to assure cross system capability.

Requires thorough knowledge of the following: OS/JCL, OS/MVS, CMS. Knowledge of the following preferred: Cullinet Tools, PL/I, VSAM. Knowledge of the following helpful: Assembler, IMS/VS DB, CICS, MARKIV.

Send resume to:

JOAN DOIG
PERSONNEL SERVICES
CLIO HALL

Princeton University
PRINCETON, NEW JERSEY 08544

An Equal Opportunity/Affirmative Action Employer

DO YOU HAVE WHAT IT TAKES?

COMPUTER SOFTWARE EXPERTS:

If you are a superior performer looking for a creative working environment with more challenge and less bureaucracy, then 4GT wants to meet you!

Fourth Generation Technology, Inc. develops state-of-the-art large 4GL business computer systems. We have a continuing rapid expansion and are looking for proven performers to design and program major systems. We provide superb working conditions including developmental mainframes and a powerful proprietary 5GL system development CASE tool.

WE NEED:

SENIOR SYSTEMS ANALYSTS

- 5 years hands-on experience specifying large systems
- 10% travel likely

SENIOR PROGRAMMER ANALYSTS

- 5 years hands-on experience developing large systems
- 4GL & DBMS experience a plus

PROGRAMMER ANALYSTS

- Requires 2 years successful experience in developing large computer systems.

Send your resume, including salary requirements to: Ms. Susan Randle, Fourth Generation Technology, Inc., 10260 North Torrey Pines Road, Suite 350, La Jolla, CA 92037. Department 311. *Equal Opportunity Employer*

4GT
FOURTH GENERATION TECHNOLOGY INC

Applications are invited for a faculty position at the Instructor/Assistant Professor level beginning Fall, 1987. Department of Computer Science Plymouth State College. Teaching responsibilities include upper level and introductory courses for CIS majors, and a general education course for non-majors. The department has six full-time faculty supplemented by lecturers and offers bachelor's degrees in Applied Computer Science and in Computer Information Systems. Instructional computing facilities include a programming laboratory, a microcomputer laboratory with a local area network, and a UNIX operating environment supported by Pyramid 98X and PDP 11/70 supermini computers.

The Plymouth Area is located at the base of New Hampshire's White Mountains, minutes from the Lakes Region, and is a major recreational center for the Northeast. Plymouth State College enrolls 3600 undergraduates in a wide variety of programs and is a major cultural focus for central New Hampshire.

Minimum Qualifications: a graduate degree with a CIS concentration; plus enrollment in doctoral program, doctorate preferred, experience in CIS analysis, design and implementation; experience, aptitude and interest in undergraduate teaching. Send resume, transcripts and three letters of recommendation to: Search Committee, Department of Computer Science, Box 2, Plymouth State College, Plymouth, New Hampshire 03264, (603) 535-2666, ext. 530. Applications will be accepted until March 1, 1987. Plymouth State College is an AA/EOE.

DATABASE ADMINISTRATOR

McM CORPORATION is seeking a qualified IDMS/R Database Administrator to implement our state-of-the-art data processing software.

This position requires a highly motivated individual with 2-4 years experience and an extensive background in the use of IDMS/R, IDD, ADS/O and Database Design are required.

McM CORPORATION offers competitive salaries and benefits, and an opportunity to grow in a dynamic environment. For immediate consideration, please send resume and salary history to:

Employment Representative
McM CORPORATION
P.O. Box 10234
Raleigh, NC 27605

NO AGENCIES OR PHONE CALLS

An Equal Opportunity Employer M/F/H

SYSTEMS DESIGNERS, PROGRAMMERS, PROJECT MANAGERS

J.J. Kenny Co., Inc., a highly regarded WALL STREET firm, and a leader in the municipal bond brokerage business, has significant career opportunities to support growth and a tradition of maintaining state-of-the-art computer systems and software.

WE OFFER: A positive, motivating work environment, plus the challenge of participating in the redesign of our entire application portfolio. Added to this, we offer excellent compensation and benefits.

WE NEED: Professionals to fill new positions designed to assist us in creating innovative systems in:

- **Municipal Bond Trading**
- **Worldwide Municipal Bond Inquiry**
- **Municipal Bond Portfolio Evaluation**
- **Back Office Operations**

WE SEEK:

- **Project Managers: 5+ years**
- **Data Base Administrators: 3-6 years**
- **Data Analysts: 2 - 4 years**
- **Senior Systems Programmer Analysts: 3+ years**

Bachelors degree required - MBA preferred. Excellent verbal/written skills necessary. If qualified, send resumé and current salary in confidence to:

Human Resources - DP
J.J. Kenny Co., Inc.
55 Broad Street - 1st floor, New York, NY 10004

JK

An equal opportunity employer

ABU DHABI NATIONAL OIL COMPANY

Abu Dhabi National Oil Company (ADNOC) controls and co-ordinates the operations of both onshore and offshore oil and gas exploration and production and associated petrochemical industries.
The Company wishes to recruit the following personnel in its Finance Directorate

SENIOR FINANCIAL ANALYST:

The candidate for this position will be required to analyze financial statements as necessary, to evaluate the impact of budgets on Group Company Balance Sheets, to follow-up and analyze financial market trends and to perform loan administration functions.
The candidate should have a first degree in Business Administration, Accounting, or equivalent coupled with at least 7 years relevant experience in financial analysis

SENIOR ACCOUNTANT:

Responsible for performing accounting duties relating to ADNOC's Cash Management. Co-ordinate and monitor the flow of funds through the company's bank accounts. Evaluates and analyze the company fund utilization activities and financial institutions holding ADNOC's funds.
The candidate for this position should have a first degree in Business Administration, Accounting or equivalent plus 6 years relevant experience in cash management.
Both positions require high proficiency in English and Arabic. Experience in computerised accounting system is also essential.
We offer competitive tax-free salaries plus a full range of expatriate benefits including free accommodation, subsidised school fees, airfares and generous paid annual leave.
Interested candidates are invited to forward their detailed applications together with photocopies of their education and experience certificates, within three weeks from the date hereof, to:

THE HUMAN RESOURCES DIVISION MANAGER
PERSONNEL DIRECTORATE
ABU DHABI NATIONAL OIL COMPANY (ADNOC)
P.O. BOX 898 — ABU DHABI — U.A.E.

POSITION ANNOUNCEMENTS

Glaxo Has The Prescription For Career Success

The fastest growing research-oriented pharmaceutical company in the U.S. has an opening at its Corporate Headquarters located in Research Triangle Park, N.C. (near Raleigh/Durham)

PROJECT LEADER

As a key member of our MIS Department, you will be responsible for:

- **Coordinating all scientific office automation activities.**
- **Determining user requirements for O/A software, hardware and user training.**
- **Evaluating, recommending and supporting O/A and other scientific software for micros and VAX systems.**
- **Implementing and supporting ALL-IN-1 on the VAX.**
- **Supervising a team of office automation analysts.**

Background should include a Bachelor's Degree with 6-8 years experience in data processing and/or office systems and 3-5 years supervisory experience. At least 2 years experience working in a VAX and microcomputer environment and good interpersonal and communication skills are required. DEC ALL-IN-1 experience highly desirable.

Your abilities and potential will be recognized with a competitive starting salary and benefits package. Our location offers a mild climate year round, access to some of the finest universities in the country, numerous cultural activities and nearby recreational facilities. For prompt consideration, please forward your resume, including salary history, to:

Dept. 86-225E-CW

(No Phone Calls, Please)
No Private Agency Referrals, Please

Glaxo Inc.
P.O. Box 13398
Research Triangle Park, NC 27709
An Equal Opportunity Employer M/F/V/H

NEW ENGLAND

BOSTON
SYSTEM-38 SPECIALIST
Nat'ly recog. mfr seeks sr. tech pro for leadership role in major HW/SW install. plus diverse new sys. devel projs. Min. 3+ yrs. w/solid RPG-III, CL & fin'l, mktg or mfg apps knowl. Exciting ground floor oppty. NE cand. pref. Salary to $40K

BOSTON
SENIOR P/A - CICS
One of SUBURBAN BOSTON's leading firms seeks six add'l. Sr. P/A's to augment devel. teams. Environ. is multi IBM 3090 MVS CICS COBOL DBMS. Oppty. to use your CICS as catalyst to join fast-growing firm. Salary to $37,000

BOSTON
VAX ANALYST
Exciting s/w devel. firm seeks astute analyst for integrated invty., fin'l & mgmt. report apps. Req. VAX/VMS, COBOL, BASIC & excellent commun. skills. Outstanding firm w/history of solid growth & promotion from within. Salary to $32,000

HARTFORD
DATA BASE (IMS, IDMS)
Data base pros seeking growth positions in data base design, data modeling, data architecture & DB sys. programming. Investigate multi oppty's. in HARTFORD area w/IBM/OS/MVS/XA install's. Salary to $34-$35,000.

HARTFORD
PROGRAMMER ANALYSTS
Major fin'l org. seeks qualified prog/analysts to work on a number of on-line devel. projs. in a CICS/IMS environ. Min. 2+ yrs. IBM exp. Co. provides excellent benefits & full reloc. Salary to $36,000.

PROVIDENCE
PROJECT MANAGER/ SOFTWARE DEVELOPMENT
Industry leader seeks mgr. for new sys. devel. Prior tech. exp. in lge IBM on-line environ. Additional exposure to structured programming & strong managerial bkgrd. are +'s. Enjoy coastal R.I. lifestyle w/excellent quality of life. $45,000.

ROBERT HALF
EDP PERSONNEL SPECIALISTS
Contact the Manager of any office listed below.
100 Summer St., Boston, MA 02110
(617) 423-1200
111 Pearl St., Hartford, CT 06103
(203) 278-7170
900 Turks Head Bldg., Providence, RI 02903
(401) 274-8700
Client Companies Assume All Fees.

ATLANTA

Southeast
Southwest

If you are seeking career advancement in the data processing profession, then talk to us. We are former computer professionals who have counselled and placed hundreds of computer professionals like yourself in the 16 years since our founding in 1970. To inquire about numerous Atlanta, Dallas, Southeast and Southwest opportunities, send your resume or call us today! **DataPro Personnel Consultants, 400 Perimeter Center Terrace-Suite 660, Atlanta GA 30346. (404) 392-4242, or 12720 Hillcrest - Suite 520, Dallas TX 75230. (214) 661-8600**

DALLAS

PROGRAMMERS
PROGRAMMER ANALYSTS

Seeking the above data processing professionals with 1+ years experience in PL/1 or IMS/DC in an IBM mainframe environment. Projects involve applications designed, development and enhancements. Competitive salary and excellent benefits. All fees, interviewing and relocation expenses paid by the employer. Positions available in the lower Midwest and the South. If interested in furthering your career goals in a growing state-of-the-art environment, please forward resume in strict confidence or call COLLECT:

308-234-6665
Beth Latimer

Dunhill
OF KEARNEY, INC.
3810 Avenue A, Suite F
Kearney, Nebraska 68847
An Equal Opportunity Employer M/F

Programmer/Systems Analyst - MBA with MIS specialty: Plan, schedule and direct preparation of programs to process business data and solve business oriented problems using computers. Design, develop and implement micro/mainframe-computer based business application systems in consultation with management personnel. Install the systems and train users. Will work with IBM/VAX mainframes and micros. Knowledge of COBOL, FORTRAN, IFPS, LOTUS, DBASE, FOCUS, SPSS and SAS. 5 day/40 hr. wk. Salary $30k-35k/yr. Mail resume to NYS Job Service, 66 W. Huron St., Buffalo, NY 14202. Job Order 0100082-DOT 012.166.066.

COMPUTER/INFORMATION SCIENCE

Tenure track, September 1987. Ph.D. preferred or Master's, teaching experience, and/or practical experience. Ability to instruct in the following: Introduction to Data Processing, MIS, Database, Systems Analysis and Design, and Microcomputer Applications. Salary to low $40's. (A second physics/computer science position also available). Send detailed resume, transcripts, and 3 letters of recommendation to:

Dr. Charles F. Collins
Vice President for Academic Affairs
Carroll College
Waukesha, WI 53186

Review of applications will begin on March 2, 1987. Carroll College is an Equal Opportunity/Affirmative Action Employer.

SACRAMENTO
& San Francisco Bay Area

Systems Programmers
VM/RCX or MVS/XA
Programmer Analyst
IBM S/36 MRP
MIS Manager
VAX & Mfg. Exp.
Data Base Administrator
VAX, ORACLE
Software Engineers
CD/ROM, Graphics

QUANTUM SEARCH
680 Howe Avenue, Suite 9
Sacramento, CA 95825
(916) 922-9674

COMPUTER MARKETING CONSULTANT

Vertical market software company seeks highly motivated, exp. marketing rep. This individual must have a solid accounting background and 2+ yrs exp. selling data processing systems solutions. Must be professional; BA, BS degree required. Salary and commission. Good benefits. Reply to: Director of Marketing

Abacus Software, Inc.,
P.O. Box 7447,
St Petersburg, FL 33734

INFORMATION SERVICES PROFESSIONALS

The Company: A multi-national partnership located in Chicago, Illinois which uses hundreds of PCs, several System 38s and Data General super-minis, a worldwide telecommunications network and anything else that gives us a competitive edge.

Positions: **Quality Assurance Analyst For Real-Time Systems**
Application Programmers (Real-Time, Interactive And Batch)
Hardware Engineers Who Like To Program
Master Diagnostician And Repair Person
Operator/Technical Support Engineers (For All Three Shifts)

General Qualifications:
- Self-starter capable of working in a totally unstructured environment under very little supervision
- Team worker who knows how to laugh at himself
- Problem definer as opposed to (dart thrower)
- User-oriented and able to withstand pressure
- Organizer tolerant of laissez faire styles

Compensation: Salary plus bonus (we pay in direct proportion for what we get), plus pension, health care/life insurance, education and other benefits.

We love it here! You might too. Respond with cover letter, including day phone number and resume to U.M. Italikeus, CW-B4874, Computerworld, Box 9171, Framingham, MA 01701-9171

VIRGINIA

Computer Operations Manager

Large computer service bureau operations (located 58 miles south of Washington, D.C.) in the direct mail marketing industry is seeking the right individual as an Operation Manager in a highly active environment. Successful candidates must be hands-on results oriented with strong people management skills. Encumbent responsible for 24 hours, 7 day week operations. Current configuration includes 24 impact printers. Qualified candidates must have 3+ years as Operations Manager with MVS/XA and JES experience. Bachelor's degree or equivalent plus demonstrated supervisory experience. Send resume to:

Robyn Tinsley, Personnel
WILAND SERVICES, INC.
P.O. Box 8446
Fredericksburg, VA 22404

equal opportunity employer

Senior Programmer for programming and systems analysis in data base area of airline control program (ACP) operating system. Performs coding, testing and modifications using specialized development tools. Writes new software for passenger airline reservations system (PARS). Develops software and testing tools to provide direct access to users. Performs duties using SABRE-TALK & BAL. Must have minimum two years experience same job; ability to work in both online & off-line environments; technical writing ability; knowledge of software development tools; if no prior ACP/PARS experience, must have two years BAL experience; skill in data base and systems interface. Hours Monday-Friday 7:30am-4pm. Salary $2,147/month. Send resume only to Job Service Of Florida, 1350 N.W. 12th Avenue, Room 280, Miami, Florida 33242. Ref: Job Order # FL4638679

SYSTEMS ANALYST, Senior

Design & supervise coding of software/firmware for proprietary database computer; port existing dbase mgmt. sys. coded in C, to UNIX based multi-processor. Req. Masters in Computer Science & 1 yr. exp. as Sr. Sys. An. or Masters & 2 yrs. exp. as Sys. An. Salary 38k/yr. Job site/interview: Chatsworth. Send this ad and a resume or letter stating your qualifications to Job # DN 11223, P.O. Box 9560, Sacramento, CA 95823-0560 not later than Feb. 10, 1987.

Northeast Magic

Major NE Bank requires financial systems design indiv., IBM 3090, MVS, COBOL, CICS, IMS, IDMS, ADSO. Ldrshp, creativity, user comm. skills. To 40K

Systems Analyst - Major mfg. co. state of the art computer-based systems, needs indiv. with analytic & comm. skills. IBM, DOS/VSE, COBOL. To 40K

Sr. P/A for comm. co. Project Mgmt. for analysis/design for new applications. IBM, COBOL, IMS, TSO. PC work included. BS req'd. To 38K

Gilbert Lane
221 Main Street
Hartford, Conn. 06105
Phone: (203) 278-7700

Independent Contractors

Section 1706 tax law solution. Retain your status and compensation without changing your work assignments. Send your resume and we will forward the information. Available to all independent contractors whether working directly for clients or through contracting firms.

Harbour Financial Inc.
P.O. Box 2701
Virginia Beach, Virginia 23450

MANAGEMENT INFORMATION SERVICES DIRECTOR
City of Greeley

New department head position in a full-service city. Currently operating with a System 80, Model 8, OS/3, running under TIP and DBMS. Multiple applications in COBOL with some RPG. Directs a staff of 5 in an excellent work environment. Requires B.S. in computer science or a related field, a minimum of 5 years' data processing experience with significant OS/3 and DBMS background, and a minimum of 3 years' supervisory experience. Ability to coordinate projects among City departments and to implement new systems is a must. Salary to $45,000 depending on qualifications. Apply by February 18th to **Personnel, City of Greeley, 919 7th St., Greeley, CO 80631. EOE.**

SALES

We are seeking a proven sales professional to assist our rapidly growing contract services firm in opening a new branch in a major southeastern city. This position offers excellent earnings and career growth. Five years sales experience a must, DP services desired. Call or send resume to:

Computer Consulting Group
3700 Forest Drive, Suite 405
Columbia, SC 29204
Attn: Don McLaurin
800-222-1273

Process Control Technical Specialist for industrial process engineering firm located in Cincinnati, Ohio. Utilizing understanding of unit operations, chemical process & instrumentation fields, knowledge of micro processor-based control systems, & concept of system approach to process control, develop piping & instrumentation diagram, process control strategies & logic, systems concept & data; write system functional specifications & system hardware specifications; develop implementation of system, programming & dynamic models & simulation; maintain system documentation. Requires Associate in Science Degree in Chemical, Electrical or Control System Engineering & 5 yrs of experience in the job described. 40 hrs/wk +/- 10% overtime. $17/hr. Qualified applicants only send resume with this ad to R. Lechler, JO # 0666945, Ohio Bureau Of Employment Services, PO Box 1618, Columbus, Ohio 43216.

RESULTS

Whether you're buying, selling, swapping, hiring or looking, you get results from **Computerworld classifieds.**

Maybe that's why **Computerworld** gets more classified advertising than all the other computer publications put together!

To place your ad, or to get a 1987 rate card with complete details on **Computerworld Classified Advertising**, call or write:

Computerworld
Classified Advertising
P.O. Box 9171,
375 Cochituate Road,
Framingham, Mass. 01701-9171
(617) 879-0700; (800) 343-6474

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

Advanced Systems Division

COMPUTER SYSTEM MANAGER

At Northrop Advanced Systems Division in Palmdale, Southern California, you can improve the quality of your career with our excellent facilities and stimulating projects. You can also improve your quality of life in this unique area an hour from the metropolitan Los Angeles area, where housing costs are attractively affordable and recreation abounds.

Manage and administer multi-functional staff responsible for maintaining large IBM mainframe CAD/CAE 2D and 3D geometry software systems and coordinating activities related to manufacturing business operations. Requires heavy user contact and exceptional communicative coordinating skills.

Please send your resume to: NORTHROP ADVANCED SYSTEMS DIVISION, Employment Office, Dept. CW2513, P.O. Box 1180, Palmdale, CA 93550. Northrop provides its employees a competitive, comprehensive benefits package.

PROOF OF U.S. CITIZENSHIP REQUIRED. Northrop is an Equal Opportunity Employer M/F/H/V.

NORTHROP

Advanced Systems Division

VAX BASED MANUFACTURING SYSTEMS

CINCOM, a $100M plus international software vendor, is recognized as the leader in providing system and applications software to the Fortune 500 companies. Its industry acclaimed technology is recognized as being premier in Relational Data Base Management, 4GL, Network Management and Manufacturing and Financial Applications.

Our United States and Canadian Applications Client Services Consulting Group now has openings for Systems Analysts, Data Base Administrators, and Programmer/Analysts that are experienced in one or more of the following areas:

- DEC/VAX based systems
- Cobol and 4GL Tools (MANTIS helpful)
- Mainframe Relational Data Base Design & Normalization (ULTRA helpful)
- MRPII Systems, Related Manufacturing Disciplines
- CIM Technologies

These positions require strong communications skills, travel, and the ability to assume a leadership role in our client environments.

If you like to work on challenging projects in Manufacturing environments, we want to hear from you. Please send resume in confidence to.

Patricia A. Sledge, VMS 2300 Montana Avenue
CINCOM SYSTEMS, INC. Cincinnati, OH 45211

CINCOM

An Equal Opportunity Employer

SYSTEMS PROJECT MANAGER

Solano County MIS is looking for an experienced project manager to work on a variety of applications. A minimum of four years experience in automated systems analysis, design, development, and project management is required. A four year degree in computer science, business administration, or public administration is desirable. Experience working with customers and staff will be emphasized. Our network includes IBM 4331, HP3000, HP1000, and microcomputer equipment. We have an aggressive automation policy which best fits hard-working self drivers who enjoy a team environment.

Sal $33,220 - $40,402 per annum. The anticipated July 1, 1987 annual salary will be $34,911 - $42,449. Final filing date for applications and resume is 2/27/87. For an application and brochure contact:

Doug Darling
Solano County Personnel Dept.
501 Texas St.
Fairfield, CA 94533
(707) 429-6321

Logos Corporation, the world leader in automatic translation of Natural Languages, is seeking a highly motivated individual to support the leading AI product in Machine Translation.

This individual will be responsible for providing sales, marketing, and installation support. This position will also be the liaison to the product development center.

Requirements include a working knowledge of MVS and VM, fluency in German or French, and good communication skills. Preference will be given to candidates with prior international exposure. Familiarity with PC/mainframe communications or Wang VS systems is a plus.

The successful candidate will receive two months of training at our New Jersey technology center, followed by assignment to our West German headquarters for one to two years.

If you have been waiting for a major career opportunity, please submit your resume and salary history in confidence to:

Mary Arthur
Logos Technology Center
111 Howard Blvd.
Ste. 100
Mt. Arlington, NJ 07856

WE'RE YOUR FUTURE

To achieve the most effective career growth you really do need the expertise of experienced career consultants who specialize, on a daily basis, in EDP placement. And you'll find that our people, at National Computer Associates, are among the very best. Also you need to know all about the great number of excellent opportunities, both locally and nationally, available to you...and it's unlikely that you'll find more elsewhere. The many specialized services and inside information we provide you is your assurance that your career moves will be the best for you.

Come in. Call. Or mail your resume to the NCA firm nearest to you. Confidentiality is assured. No charge to you whatever. Now is the time for us to do something good for your future.

[illegible]

National Computer Associates

SCT

DATA PROCESSING

Consider A Consulting Firm With A Virtually Unlimited Market!

SCT is positioned in the forefront of developing and marketing advanced, specialized software systems and services for government and institutions of higher education. We have immediate expansion openings in the Philadelphia area and at a central NJ client site.

CORPORATE HEADQUARTERS MALVERN, PA

- **PROJECT MANAGERS**—IBM large scale development experience.
- **SYSTEMS ANALYST**—Minimum 3 years experience in the analysis, design, and implementation of on-line financial systems.
- **PROGRAMMER ANALYSTS**—ADSO/IDMS or COBOL/CICS.
- **CONSULTANTS**—Student systems or financial. Minimum of 3 years of experience in the design and implementation of systems is required. Will be responsible for user interface and installation of new systems.

PHILADELPHIA CLIENT SITE LOCATION

- **ACADEMIC CONSULTANTS**—Requires a minimum of 2 years of experience in academic computing. Experience in training, documentation, and microcomputing necessary.
- **MICROCOMPUTER CONSULTANTS**—IBM PC, XT, APPLE or IBM Compatibles.

CENTRAL NEW JERSEY CLIENT SITE

- **PROGRAMMING MANAGER**
- **ADMINISTRATIVE MANAGERS**

BALTIMORE CLIENT SITE

- **MICROCOMPUTER TRAINING INSTRUCTORS**
- **MICROCOMPUTER SPECIALISTS**

Qualified applicants should call: **T. Hoopes at 1-800-441-7247; in Pennsylvania (215) 647-5930,** or send a resume to: **SCT, Great Valley Corporate Center, 4 Country View Road, Malvern, PA 19355.**
An Equal Opportunity Employer M/F

PROJECT SYSTEMS ANALYST

A progressive enamel coated paper manufacturer located in Central Wisconsin has an opening for an experienced Systems Analyst. This person, reporting to the Special Projects Manager, will develop and implement computer systems to meet the information processing needs of user departments. Both routine and moderately complex projects would be carried out. This individual will completely develop systems from initial contact with end-users through final implementation of finished product using 4th generation application generators. This includes all analytical and development work. Knowledge of large IBM mainframes, associated software usage and JCL required.

Bachelor's degree in computer science, math or business administration and at least 3 years of systems analyst experience. Knowledge of data base usage would be helpful, and a knowledge of ADR Datacom DB and IDEAL would be helpful, but not mandatory.

Excellent employee benefits, liberal relocation program. Send resume and salary requirements to:

Bert E. Johnson
Professional Employment Manager
CONSOLIDATED PAPERS, INC.
P.O. Box 50
Wisconsin Rapids, WI 54494
An Equal Opportunity Employer M/F/H/V

Computerworld Sales Offices

Publisher/Vice-President/Donald E. Fagan

VP/Sales/Edward P. Marecki
Manager/Marketing & Sales Operations/Kathy Doyle
COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
(617) 879-0700

BOSTON SALES OFFICE (617) 879-0700
Northern Regional Manager/Michael F. Kelleher
District Managers/David Peterson, Bill Cadagan
Account Manager/Sherri Driscoll
Sales Assistant/Nicia Longley
COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171

CHICAGO SALES OFFICE (312) 827-4433
Midwest Regional Manager/Russ Gerches
District Managers/Kevin McPherson, Larry Craven
Sales Assistant/Kathy Sullivant
COMPUTERWORLD, 2800 South River Road, Suite 304, Des Plaines, IL 60018

NEW YORK SALES OFFICE (201) 967-1350
Eastern Regional Director/Michael J. Masters
Senior District Manager/Doug Cheney
District Manager/Fred Le Sapin, Frank Genovese
Account Manager/Jennifer Lindsay
Sales Assistants/Mary Tagliareni, Sue Larson
COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652

LOS ANGELES SALES OFFICE (714) 261-1230
District Manager/Carolyn Knox
Western Regional Director/William J. Healey
COMPUTERWORLD, 18004 Sky Park Circle, Suite 255, Irvine, CA 92714

SAN FRANCISCO SALES OFFICE (415) 421-7330
Western Regional Director/William J. Healey
Senior District Manager/Barry Milione
District Managers/Ernie Chamberlain, Mark V. Glasner
Account Manager/Diane Fuller
Account Manager, Classified/Nicole Boothman
COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0756
District Manager/Jeffrey Mervack
Eastern Regional Director/Michael J. Masters
Sales Assistant/Melissa Christie
COMPUTERWORLD, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319

DALLAS SALES OFFICE (214) 991-6386
District Manager/Mark V. Glasner
Western Regional Director/William J. Healey
COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, CA 94133

VIRGINIA SALES OFFICE (703) 280-2027
District Manager/Bernie Hockwender
Eastern Regional Director/Michael J. Masters
COMPUTERWORLD, 3022 Javier Road, #210, Fairfax, VA 22031

CLASSIFIED ADVERTISING (617) 879-0700
National Recruitment Sales Manager/Al DeMille
COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
CW INTERNATIONAL MARKETING SERVICES
Managing Director/Frank Cutitta
COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
(617) 879-0700

CW Communications/Inc.

Patrick J. McGovern
Board Chairman

Axel Leblois, Chief Executive Officer, CWCI, Inc.
Tom Cassalegno, President, CWCI, Inc
Lee Vidmer, President, CWCI/Framingham

Publisher/Vice-President, Donald E. Fagan. Senior VP-Communication Services, Jack Edmonston. VP-Sales, Edward P. Marecki. VP-Finance, William P. Murphy.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: (617) 879-0700. Telex: 95-1152, FAX: (617) 875-8931

SALES: Vice President/Display Sales, Edward P. Marecki. National Recruitment Sales Director, John Corrigan. Manager/Marketing & Sales Operations, Kathy Doyle. Display Advertising Manager, Carolyn Novack. Classified Operations Manager, Cynthia Delaney.
MARKETING: Director of Marketing, Bob Singer
COMMUNICATION SERVICES: Senior Vice-President, Jack Edmonston. Director Research, Kathryn Dinneen. Sales Promotion Director, Liz Johnson.
PRODUCTION: Production Director, Peter Holm. Senior Production Manager, Leigh Swanington. Typesetting Manager, Carol Polack. Art Director, Tom Monahan
CIRCULATION: Circulation Director, Nancy L. Merritt.
MIS: Corporate Director MIS, Jeff Cordero.

Foreign Editorial/Sales Offices

Argentina: Ruben Argento, CW Communications S/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583. Telex. (390) 22644 (BAZAN AR).

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. Telex. (780) 72827 (COMWOR HX).

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065 Phone: (011) 61 2 4395133. Telex: (790) AA74752 (COMWOR).

Austria: Manfred Weiss, CW Publikationen Verlagsgesellschaft m.b.H., Josefstädter Strasse 74, A-1080 Wien, Austria. Phone: (011) 43 222486 5910. Telex: (847) 115 542 (SCH/A).

Brazil: Ney Kruel, Computerworld do Brazil, Rua Alcindo Guanabara, 25-11 andar, 20 031 Rio de Janeiro, RJ Brazil Phone: (011) 55 21 240 8225. Telex: (391) 21 30838.

Denmark: Preben Engell, Computerworld Denmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (011) 45 1955 695. Telex: (855) 31566.

France: Jean-Louis Rendon, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: (011) 33 14 747 1272. Telex. (842) 613234 F.

Hungary: Dezso Fulasz, Computerworld Informatika Co., Ltd. H-1536 Budapest, Pf 386, Hungary. Phone: (011) 36 1 228 458. Telex: (861) 22 6307 (KSHP H).

Italy: Dr. Bruno Fazzini, Computer Publishing Group S.R.L., Via Vida 7, 20127 Milano, Italy. Phone: (011) 39 02 2613432. Telex. (843) 335318.

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (011) 81 3 551 3882. Telex: (781) 252-4217 (Computerworld Japan only).

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: (011) 81 3 230-4117/4118. Telex: (781) J26880 (reps for all CWCI publications except Computerworld Japan).

Mexico: Henry Morales, Computer Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (905) 514-4218 or 6309. Telex: (383) 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 64, 1071 GK Amsterdam, The Netherlands. Phone: (011) 31 20 646426. Telex. (844) 16242 (CWCDM NL).

New Zealand: Reg Birchfield, CW Communications Ltd., 13 Maidstone St., Grey Inn, Auckland 1, New Zealand. Phone: (011) 64 9 768 993. Fax: (011) 64 9 780 244.

Norway: Morten Hansen, CW Norge A/S, Hovnsveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (011) 472 647725. Telex: (856) 76478 (CW NOR N).

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Phone: (011) 47 614 6174. Telex. (716) 222214 (CCW CN).

Spain: Francisco Zabala, Computerworld Espana, Rafael Calvo 16 4B, 28010 Madrid, Spain. Phone: (011) 34 1 419 4014. Telex: (831) 47894 (CW E).

Sweden: Bengt Mamfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: (011) 46 6 67 91 80. Telex: (854) 14904 9 (NOVACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Weinbergstrasse no. 15, Postfach 253, CH - 8030 Zurich, Switzerland. Phone: (011) 41 1 55 10 77. Telex. (845) 816 710.

Taiwan: Leona Wang, ACE Media Agency Co. Ltd., P.O. Box 26-578 Taipei, Taiwan, R.O.C. Phone: (011) 02 751 3636. Telex: (785) 14142 (ACE GROUP). (Representative for all CWCI publications).

London: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (011) 44 1 831 9252. Telex: (851) 262345.

United Kingdom: Euan Rose, Beere Hobson & Associates, 34 Warwick Road, Kenilworth, Warwickshire, CV8 1HE, United Kingdom. Phone. (011) 09 26 512424. Telex: (851) 311951 (BEEHOB). (Representative for all CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 13, Oficina H, Av. Libertador. Caracas, Venezuela. Phone: (011) 58 2 72 76 20.

West Germany: Eckhard Utpadel, CW Publikationen Verlagsgesellschaft mbH, Rheinstrasse 26/28, Postfach 40 0429, 8000 Munchen 40, West Germany. Phone: (011) 49 89 360860. Telex: (841) 5215350. (COMW D).

ADVERTISERS INDEX

ADR 3
Aluminum Case Company 71
Artificial Intelligence 15
AST Research 56-57
Ausdata 13

BASF 60
Bendata 29

Cambex 13
Canaan Computer 14
Chen & Associates 25
Codex Corp. 22
Comdisco 52-53
Communication Networks '87 73
Compaq 68-69
Compuscan 45
Computer Management Research 35
Cullinet 19
CW Corporate 78
CW Circulation 66
CW DIAL INQ Reader Service 90
CWIMS Denmark 67
CWIMS LandGrant 74
CWIMS Switzerland 67

Data Design Associates 36
Datalex 8
Dataware 57
DBMS Inc. 46

Electronics Forms Systems 24-25
EMC Corp. 42

Federal Communications 54

Group Operations 10

Hewlett-Packard 76-77
H&M Systems 96
Honeywell 48-49

IBM 28-29

Innovation Data Processing 7
ITT 43

JCA Software 44

Leasametric 54
Local Data 18
Lotus Development Corp. 30-31

McCormack & Dodge 97
Michaels,Ross & Cole Ltd 56
Micom/Interlan 38,47
MTI Systems 61

Novell 64-65

On-Line Software International 32
Oracle 9,27,37

Peat Marwick 39

Racal-Vadic 63
Radio Shack 71
Realia,Inc. 72
Relational Technology 26
Ryan-McFarland 45

SAS Institute 20-21,23
Software Technology & Research (STAR) 10
Sorbus 58
Syncsort 5
Systems Software Associates 34

Tandem 40
Teknowledge 11
Technologic Software Concepts 12
Televideo 75
Telex 55
Travtech 38
Tymnet 50

Walker Interactive 62
Wyse 70

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Ansa, Lotus ink Paradox pact; TAC gains support

By Douglas Barney

BELMONT, Calif. — Ansa Software and Microrim, Inc. both recently announced support for Lotus Development Corp.'s The Application Connection (TAC), a software product aimed at the micro-to-mainframe market.

"We have a very extensive micro-to-mainframe strategy. The first component of that strategy is the relationship with Lotus under which Paradox and TAC will work together," said Ron Posner, president and CEO of Ansa.

Ansa also reached a joint marketing relationship with Cambridge, Mass.-based Lotus involving Paradox, Ansa's data base software. According to Posner, the joint marketing relationship involves both current and future products.

"The joint marketing relationship will go on into the future for other products that each of us will come out with that will work together," Posner said. "Our salespeople will jointly try to sell TAC with Paradox and vice versa."

Data base access

TAC allows microcomputer users to access data on mainframe-based data base programs and fourth-generation languages, while using a personal computer-type user interface.

Ansa is looking to develop or license additional technology that will allow Paradox to communicate with a variety of systems. The local-area network version of Paradox will be unveiled in a couple of months and will ship by the end of the second quarter, Posner said.

Redmond, Wash.-based Microrim earlier this month announced a direct interface from its R:Base System V data base software to TAC. Using R:Base System V's File-gateway utility, files from supported mainframe data bases are automatically converted to a format usable by R:Base. System V now also has the ability to export files in the same file format as Ashton-Tate's Dbase III.

In addition, Ansa announced an OEM program and signed its first OEM agreement with Wang Laboratories, Inc. under which Wang will market Paradox through its 1,250 direct field sales representatives.

In other news, Ansa is seeking a way to allow Paradox to take advantage of the untapped power of Intel Corp. 80286- and 80386-based microcomputers and may not wait for Microsoft Corp. to pave the way with its next version of MS-DOS.

"As soon as we can find a way to break through the 640K-byte memory barrier on the 286 and the 386, we will immediately take advantage of the memory with the current product without it being rewritten," Posner said.

"If we can figure out a way to do that without Advanced DOS [the anticipated next version of DOS from Microsoft], we will do it and have the product in very short order. We have to find a way through the 640K-byte memory barrier," he added.

Posner, however, is uncertain whether this approach is technologically possible.

IBM rebound hampered

From page 1

tinue. It is a fundamental change in the nature of demand, indicating IBM's problems are deeper than people are willing to recognize."

IBM's well-publicized mid-range systems shortcomings were apparently acknowledged by Chairman John F. Akers, who cited "unsatisfactory levels of demand for parts of our product line" as one reason for Big Blue's 1986 performance.

But IBM must also move quickly to stem a mass exodus of potential 3090 buyers into the used 3080 market.

A recently completed International Data Corp. survey of 500 IBM user sites indicated intentions to purchase only 202 3090 CPUs in the first half of this year, compared with roughly 1,020 such purchases in the first half of 1986.

However, the same buyers intend to purchase 786 3080 processors, up from 675 in 1986, the survey showed.

"IBM's big battle is to drag as many of those as possible back into the 3090 column," IDC analyst Frank Gens said. "They have got to improve the price/performance of the 3090 to get that revenue."

'VAX killer'

All indications are that the 9370, dubbed the "VAX killer" in reference to Digital Equipment Corp.'s highly successful mid-range computers, could be IBM's make-or-break product this year.

"Since sales of PCs were flat and Sierra sales were up, the problem was obviously in the mid-range," said Michael Geran of E. F. Hutton & Co.

Salomon Brothers, Inc. analyst Marc Schulman estimated that IBM has received 30,000 orders in the U.S. and 15,000 orders overseas for the 9370.

He predicted that IBM will ramp up volume 9370 production in the second quarter, producing significant revenue just as Big Blue sees the positive benefits of last year's work force reductions and plant closings.

"By mid-year, all the people coming off the payroll will be off, costs will be down and shipments will be up," Schulman said. "And as the use of IBM's connectivity software and DB2 proliferates, that will consume considerable machine cycles. I expect a recovery, but by no means a return to the glory days of 1983 and 1984."

Scholman predicted that IBM will gear up a new product cycle this year with a 15% price/performance enhancement of the 3090, a low-end "clone killer" Personal Computer, a new Intel Corp. 80286-based micro, a six-way 3090 processor and an 80386-based microcomputer.

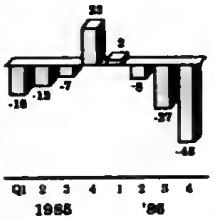
Rooney, however, suggested that 9370 sales may cut into demand for the processing power of IBM's high-margin mainframes.

"The 9370 accelerates what DEC is doing to IBM," he said.

"You've got to sell an awful lot of $100,000 and $200,000 boxes to make up for the lost multimillion dollar mainframes. The company is not positioned, from a cost standpoint, to sell a lot of smaller systems," he added.

IBM Earnings

Percentage gain / decline compared with year earlier



CW CHART

Consolidation efforts

IBM took several steps to reduce its work force and consolidate operations during the year, resulting in a fourth-quarter charge of an estimated $425 million.

Fourth-quarter profits of $1.39 billion resulted in a full year decline in profits of 27%, from $6.55 billion to $4.79 billion — their lowest level since 1982. Per-share profits fell from $10.67 in 1985 to $7.81.

Rental income dropped by 35% during the year, while revenue from services increased 24%.

IBM's pretax profit margins dropped significantly from 23.2% in 1985 to 16.4%. Net profit margins fell from 13.1% to 9.3%.

Saved by currency

The decline in the U.S. dollar's value between 1985 and 1986 prevented IBM's disappointing year from being a major disaster.

IBM estimated that the favorable currency valuation added $4.35 billion to its revenue and $645 million to its bottom line.

A company statement said IBM's first-quarter 1987 earnings will be less than its profits in the first quarter of 1985, in which profits fell 18% from 1984 levels to less than $1 billion.

3Com to buy Centram, developer of Tops distributed networking system

By Douglas Barney and Patricia Keefe

SANTA CLARA, Calif. — In a move strengthening its position in the Apple Computer, Inc. networking market, 3Com Corp. last week signed a letter of intent to acquire Centram Systems West, Inc., developer of Tops, a distributed networking software package.

The deal is expected to be finalized by the end of the month and calls for a stock exchange and a pooling of interests.

The Centram purchase is the first step under a vision that involves building a federation of software companies at 3Com to provide a host of products that plug and play, said Robert Bressler, vice-president and general manager of 3Com's Software Division.

"The next step is to look around and find software companies that will help bolster our leadership position in the local-area network market," Bressler said, adding, "Centram does that." 3Com will either purchase those companies or form strategic alliances.

Right now, 3Com will concentrate on building Tops compatibility into its Macintosh product line. "We will quickly offer the 3Server3+ as a server for the Tops line," Bressler said.

Ethermac, 3Com's low-end solution linking IBM Personal Computers to Macintoshes, "will not be the focus of any new marketing efforts," although it will continue to be supported, Bressler said. Users prefer the Tops interface to Ethermac's, he added.

"Yes, we are backing away from Ethermac and putting our focus into integrating Tops into 3Com solutions," Bressler said. Those plans are expected to dilute the efforts of Orem, Utah-based local-area network rival Novell, Inc., which is hard at work developing Macintosh compatibility with its own networking software, Advanced Netware. Novell is expected to show prototypes in the near future.

Novell and 3Com are already battling it out for market share in the IBM PC and compatible networking arena. The Centram purchase allows 3Com to fill gaps in its product line, both vendors said, and eliminates some overlap between the two product lines and dealer agreements.

For example, while 3Com provides gateways in the electronic mail area and print spooling, Tops provides Unix interconnection and Adobe Systems, Inc. Postscript conversion.

3Com will position Centram as an entry-level system providing a soon-to-be-built upgrade path to 3Com's 3+ networking software.

Users believe the 3Com acquisition might expand the product's market. With 3Com owning Tops, his company might take a closer look at Tops, said Chuck Miller, member and former president of Gateway Microcomputer Managers Association in St. Louis.

This acquisition of Centram Systems by 3Com might also serve to make Tops more attractive to Pratt & Whitney Aircraft. "It moves it from 10th priority to eighth priority," said Ron Goldfarb, manager of office automation at Pratt & Whitney's administration section in Hartford, Conn.

Tops has been installed on 15,000 workstations in its first five months on the market. It allows Macintosh computers to transparently share files with Unix-based machines and Microsoft Corp.'s MS-DOS.

The buyout is not expected to encounter the difficulties faced by 3Com in its failed attempt last spring to merge with Convergent Technologies, Inc. Because Centram is a private company, the buyout is subject to different rules and easier to pull off, 3Com's Bressler said.

Senior writer David Bright contributed to this report.

HP founder Hewlett to retire

By Clinton Wilder

PALO ALTO, Calif. — Hewlett-Packard Co. Vice-Chairman William R. Hewlett, one of the modern computer industry's founding fathers, announced last week that he will retire from the HP board Feb. 24.

Hewlett, 73, founded the minicomputer and scientific instruments firm in 1939 with partner David Packard and has served on the board since HP was incorporated in 1947. Packard will remain chairman of the board.

Shozo Yokogawa, president of Yokogawa Electric Corp., will also retire from the HP board. The new directors expected to be approved at the Feb. 24 annual meeting are Hewlett's son, Walter B. Hewlett, Packard's son, David Woodley Packard, and Ford Motor Co. Chairman Donald E. Petersen.

In other major executive changes within the industry last week, Norman Block resigned as chief financial officer of Ashton-Tate, Gabriel Fusco resigned as chief executive officer of Iomega Corp. and former U.S. Rep. Ed Zschau returned to the chairmanship of Systems Industries, Inc.

Enmasse pulls operations plug

From page 94

masse had lagged behind its product development schedule, and development costs exceeded expectations, he said.

"The original business plan called for a product to market in one year at a cost of less than $10 million," Gardner explained. "Instead, it took 2½ years and $18 million, and it was going to take another $5 million to reach profitability. The investors felt this was far in excess of their expectation."

The company's group of investors was led by venture capital firm Oak Partners in Westport, Conn. Gardner said he requested an additional $5 million at a board meeting on Jan. 17 but that the investors declined the request.

Only six employees remain at Enmasse, which once employed 72, and the firm's goal is solely to sell the remainder of the company to interested parties, according to Gardner. "We believe we will locate a purchaser of our technology very soon," he said. A likely buyer is Toitec Computers, Inc. in Scottsdale, Ariz., which may acquire Enmasse's ECS family as the basis of its Pick-based systems.

Enmasse developed, manufactured and marketed the ECS family of Unix-based multiprocessor systems, designed for general-purpose business applications. Last Tuesday, it was scheduled to introduce the ECS 2000 line of products, which could handle, in various configurations, from eight to 2,880 simultaneous users and deliver as many as 200 million instructions per second in processing power [CW, Jan. 19].

Four-month-old Toitec had planned for Enmasse computers to be its flagship hardware line, integrating the Pick operating system and Unix on Enmasse and other hardware to sell through a dealer network. As part of its OEM agreement with Enmasse, Toitec gained the right to manufacture and market Enmasse hardware should Enmasse cease operations, according to Toitec President Alfred DeiMaggi.

If Toitec completes the purchase, Enmasse research and development could continue under the Toitec name, remaining in Massachusetts, he added. DeiMaggi said Toitec had received seed capital from Enmasse's investors but that the additional financing to buy Enmasse's assets will not come from that group.

Gardner said Enmasse has not declared bankruptcy and "remains open to sell off its technology and to meet its obligations to banks and customers."

Enmasse had lined up nine resellers of its computers and installed 20 systems at an average price of $75,000 each, according to Gardner.

Gardner is the third Enmasse president in as many years, having succeeded Chester Fennell in spring 1986. Fennell had taken over from Enmasse Founder Robert Downs in fall 1985.

Wang, Unysis post losses

From page 94

traordinary tax credit — on revenue of $336.7 million. A year earlier, Amdahl earned $13.7 million, or 29 cents per share, on sales of $257.2 million.

For the year, revenue was $966.3 million, compared with $862 million in 1985.

DG. Continuing its eclipse by the long shadow of Digital Equipment Corp., the Westboro, Mass., minicomputer maker reported revenue of $313.3 million. Net income of $3.3 million, or 12 cents per share, included a $3 million tax credit.

Prime. The Natick, Mass., vendor said fourth-quarter profits declined to $14.1 million even though revenue increased 10% over the year-earlier quarter to $230.9 million. For the year, revenue increased 12% to $860.2 million, while profits dropped 19% to $45.9 million.

Harris. Harris reported second-quarter profits of $20.1 million, or 49 cents per share, compared with $14.5 million, or 36 cents per share, a year ago. Revenue, however, dropped slightly to $525.2 million.

Sun. Chief Executive Officer Scott McNealy said a production ramp-up that exceeded expectations accounted partially for the workstation vendor's record second quarter. Revenue soared to $115.3 million from $42.2 million a year earlier, and profits jumped to $8.5 million from $1.7 million.

Unisys shareholders' profits, expectations on the upswing

ACTIVE ISSUES
Kathy Porteus

Even if investors were not thrilled by the company name chosen for the Burroughs Corp.-Sperry Corp. merger, few shareholders of Unisys Corp. (UIS — 94⅜) would complain about the stock's performance in recent months. Since mid-September, when the merger was completed, Unisys shares have soared 42%. Nevertheless, some analysts still consider the stock a good value.

"If Mr. Blumenthal continues the excellent job he has done over the past six months, the stock should work its way considerably higher," says Stephen Dube of Shearson Lehman Brothers, Inc. in reference to Unisys Chairman W. Michael Blumenthal. Such kudos come Blumenthal's way because restructuring the merged company and sales of certain assets are yielding greater than expected results.

For example, by the end of 1986, Unisys had sold $1.8 billion worth of assets, including Sperry's aerospace group and portions of Memorex Corp., Burroughs' former computer-storage unit. Blumenthal had originally targeted receipt of $1.5 billion from asset sales by 1988. In addition, the firm now indicates that its annual rate of cost savings from consolidating operations totals $3 million, which is double Blumenthal's original estimate.

Asset sales, which result in lower interest charges, and vigorous cost-cutting should greatly benefit Unisys's earnings this year, according to Don Young of Sanford C. Bernstein & Co. Young was one of the few analysts on Wall Street to have favored the Burroughs-Sperry merger from the start.

"With these factors, you have more confidence in earnings estimates, particularly when demand for computer systems remains weak," Young says. He says Unisys will earn $9 per share this year.

According to Young, new product cycles, such as that of Sperry's mid-range 1100 Model 400 processor, further support the argument for Unisys. "Even if we experience a recession in commercial systems," he says, "Unisys, with so much of its business from service, defense and government, should still hold up better than most."

Although Shearson Lehman's Dube aggressively recommends NCR Corp., he still likes Unisys, which he says should continue rewarding shareholders. Dube estimates Unisys will earn at least $7 per share this year. But citing uncertain growth expectations for the computer industry this year, Dube says, "We are obviously dealing with moving targets when it comes to the earnings of Unisys and others."

Although many analysts base their recommendations of Unisys on this year's earnings, at least one — Martin Simpson of Martin Simpson & Co. — says he prefers concentrating on longer term issues, causing him to be wary of the stock.

"The big write-offs Unisys took in the fourth quarter of 1986 mean clear sailing for at least a while," Simpson says. "But the real questions facing Unisys and its shareholders concern the number of customers Unisys prevents from migrating to other equipment manufacturers and whether Unisys can meld its two disparate organizations enough so a consistent product line and marketing strategy emerges that enables the company to grow, rather than just defensively hang on to its customer base."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Software earnings climb

From page 94

though, they realized software was more important than hardware," Bloom said.

Recent increases in hardware spending have also helped the software industry, according to Kenneth J. Burke, software analyst for Alex Brown & Sons, Inc. in Baltimore.

Other leading vendors reporting financial results included:

ASK Computer Systems, Inc. The Los Altos, Calif., manufacturing applications vendor reported second-quarter revenue of $21.2 million, a gain of 11% from $13 million for second-quarter 1986. Net income was $2 million, or 15 cents per share, compared with $1.8 million, or 14 cents per share, a year earlier.

ASK stands to gain ground this year with the expected continuing success of the minicomputer market.

Computer Task Group, Inc. The Buffalo, N.Y., software consulting and programming analysis firm reported fiscal 1986 revenue of $143.4 million, up 24% from $115.8 million. Net income increased 26% to $5.1 million. Per-share earnings were flat at 68 cents, reflecting a greater number of shares outstanding.

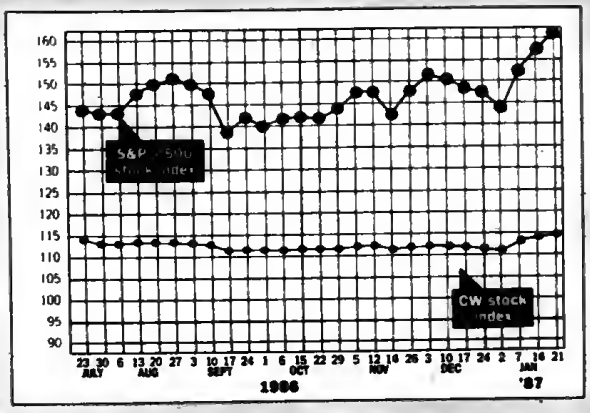
Fourth-quarter revenue was up 21% to $38.7 million. Net income was flat at $1.3 million, or 17 cents per share, because of costs associated with a recent reorganization.

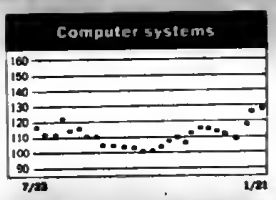
Software Publishing Corp. The Mountain View, Calif., microcomputer applications vendor said its first-quarter revenue for this year was $8.7 million, up 25% from $6.9 million. Net income doubled to $1.2 million, or 17 cents per share, from $517,000, or nine cents per share, in the year-earlier quarter.

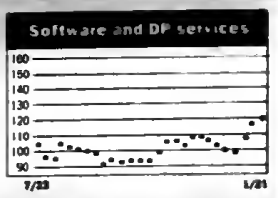
COMPUTER INDUSTRY

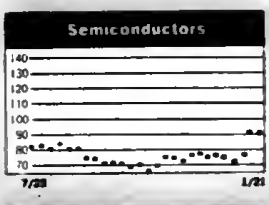
MITCHELL | HAYES

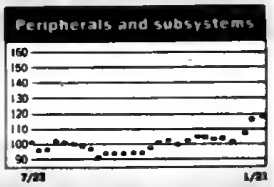
Computerworld stock trading index

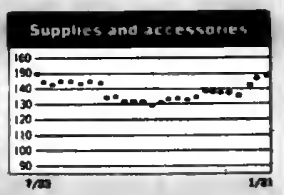












All indexes reflect a historical base of 100 on Dec. 31, 1984, and track stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

	1/16/87	1/21/87
Computer systems	125.3	127.8
Software and DP services	114.5	119.2
Peripherals and subsystems	115.6	117.0
Supplies and accessories	146.8	148.5
Semiconductors	90.4	90.4
Leasing companies	104.5	107.3
CW stock index	114.5	116.8
Standard and Poor's 500 stock index	157.0	160.2

Computerworld stock trading index

CLOSING PRICES WEDNESDAY, JANUARY 21, 1987

COMPUTER SYSTEMS

EXCH		52 WEEK RANGE (1)		PRICE CLOSE JAN 21 1987	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	6	4	4.63	-0.1	-2.8
O	ALTOS COMPUTER SYS	16	10	14.00	+0.4	+2.8
4	AMDAHL CORP	32	14	28.00	+2.3	+6.7
O	APOLLO COMPUTER INC	21	6	16.38	+0.6	+4.7
O	APPLE COMPUTER INC	56	22	49.00	+0.6	+1.8
N	AT&T	38	21	26.75	+1.5	+5.9
O	C P T CORP	7	3	4.00	-0.3	-5.6
N	COMPAQ COMPUTER CORP	25	12	23.50	+0.0	+0.0
4	COMPUTER CONSOLES INC	12	6	9.63	+0.4	+4.1
O	CONCURRENT COMP CORP	25	1	14.25	-2.8	-16.2
N	CONTROL DATA CORP	25	16	27.50	+2.3	+8.9
O	CONVERGENT TECH	14	4	8.38	+0.1	+1.5
N	CRAY RESH INC	110	59	105.88	+9.6	+10.3
O	DAISY SYS CORP	25	6	6.38	-1.3	-11.8
N	DATA GEN CORP	48	25	38.25	+3.0	+8.5
N	DATAPOINT CORP	6	5	5.25	-0.5	-8.7
N	DIGITAL EQUIP CORP	145	72	140.00	+10.0	+7.7
N	FLOATING POINT SYS INC	48	11	12.25	-1.1	-8.4
N	GOULD INC	31	15	18.38	+0.1	+0.6
N	HARRIS CORP	37	26	35.00	+1.6	+5.7
N	HEWLETT PACKARD CO	54	36	52.38	+3.4	+6.9
N	HONEYWELL INC	84	48	83.50	+3.8	+6.3
N	IBM	162	116	122.75	+4.1	+3.5
O	IPL SYS INC	4	1	2.00	-0.3	-11.1
N	ITT CORP	60	35	57.75	+0.4	+0.7
N	M A COM INC	16	12	13.50	+0.1	+0.9
N	MATSUSHITA ELEC INDL LTD	136	62	126.75	+4.6	+4.0
O	MENTOR GRAPHICS CORP	24	11	22.50	+1.8	+8.4
N	NBI INC	14	6	10.38	+0.0	+0.0
N	NCR CORP	88	40	56.75	+3.4	+6.3
N	PRIME COMPUTER INC	26	16	21.13	+1.1	+5.6
O	STRATUS COMPUTER	34	17	29.75	+2.3	+8.2
O	SYMBOLICS INC	15	4	4.25	-0.6	-12.8
O	TANDEM COMPUTERS INC	53	21	49.25	+6.8	+15.6
N	TANDY CORP	49	31	47.00	-0.6	-1.8
N	TEXAS INSTRS INC	148	103	134.38	+0.4	+0.3
4	ULTIMATE CORP	35	13	23.88	+1.4	+6.1
N	UNISYS	87	58	95.88	+6.6	+7.6
4	WANG LABS INC	22	11	13.88	-0.1	-0.9
4	WANG LABS INC	22	11	13.88	+0.0	+0.0
N	XEROX CORP	72	48	67.00	+0.8	+1.1

SUPPLIES & ACCESSORIES

EXCH		52 WEEK RANGE (1)		PRICE CLOSE JAN 21 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMER BUSINESS PRODS	37	23	27.25	-0.1	-0.5
N	BARRY WRIGHT CORP	25	14	16.13	-0.4	-2.3
A	DUPLEX PRODS INC	23	16	16.00	+0.0	+0.0
N	ENNIS BUSINESS FORMS INC	31	22	30.25	+2.1	+7.6
N	3M CO	132	86	125.38	+8.3	+7.7
N	MOORE LTD	26	16	22.50	-0.4	-1.8
O	STANDARD REGISTER CO	50	32	39.50	+0.5	+1.3
N	WALLACE COMPUTER SVCS	50	37	46.00	-1.5	-3.2

SOFTWARE & DP SERVICES

EXCH		52 WEEK RANGE (1)		PRICE CLOSE JAN 21 1987	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	7	3	4.50	-0.5	-10.0
N	ADVANCED SYS INC	20	12	16.63	+0.4	+2.1
N	AGS COMPUTERS INC	35	17	32.88	+0.5	+1.5
O	AMERICAN MGMT SYS INC	27	11	25.25	-0.5	-1.6
O	AMERICAN SOFTWARE INC	20	6	16.38	+0.6	+3.3
N	ANACOMP INC	7	3	4.63	+0.6	+15.6
O	ANALYSTS INTL CORP	10	4	6.88	+0.4	+3.6
O	ASHTON TATE	30	10	27.38	+2.4	+9.5
O	ASK COMPUTER SYS INC	15	6	13.13	+0.1	+1.0
O	ASTRADYNE COMP IND	3	1	1.88	-0.1	-5.7
N	AUTOMATIC DATA PROC	46	25	45.25	+2.9	+6.6
O	BOOLE & BABBAGE INC	6	4	6.00	+0.6	+10.3
O	COMPUTER ASSOC INTL INC	25	17	16.50	+0.0	+0.0
O	COMPUTER HORIZONS CORP	14	10	13.00	+0.1	+1.0
O	COMPUTER NETWORK TECH	10	4	4.66	+0.2	+4.3
N	COMPUTER SCIENCES CORP	52	30	50.50	+1.6	+3.6
O	COMPUTER TASK GROUP INC	16	11	12.75	-0.6	-4.7
O	COMPUTONE SYS INC	6	0	0.16	+0.0	+0.0
O	CONSHARE INC	16	10	12.00	+0.3	+2.1
N	CULLINET SOFTWARE INC	16	8	6.38	-0.3	-2.6
O	CYCARE SYS INC	17	7	8.75	-0.3	-2.5
O	DUQUESNE SYS INC	33	15	38.50	+1.5	+4.1
N	GENERAL ELEC CO	99	67	67.13	+6.1	+6.7
N	GENERAL MTRS CORP	50	24	30.25	+1.6	+5.7
O	HOGAN SYS INC	15	7	14.50	+0.6	+4.5
O	INFORMATION SCIENCES INC	4	1	1.38	+0.1	+10.0
O	INFOTRON SYS CORP	16	7	6.00	-0.5	-5.8
O	KEANE INC	16	5	6.00	-0.1	-2.0
N	LOGICON INC	39	22	26.25	-0.6	-2.2
O	LOTUS DEV CORP	88	20	84.00	+6.8	+11.8
O	MANAGEMENT SCI AMER	16	11	16.63	-0.6	-3.6
O	MCI COMM CORP	13	6	8.75	+0.0	+0.0
O	MICOM SYS INC	23	10	18.00	+1.3	+8.5
O	MICRO PRO INTL CORP	4	2	3.13	+0.4	+13.6
O	MICROSOFT CORP	70	26	67.75	+7.8	+12.9
O	NATIONAL DATA CORP	26	16	22.75	+0.0	+0.0
O	ON LINE SOFTWARE INT	16	10	16.75	+3.0	+16.0
O	ORACLE SYS CORP	30	13	38.00	+1.0	+3.7
N	PANSOPHIC SYS INC	38	25	35.75	+2.5	+7.5
Q	POLICY MGMT SYS CORP	30	15	26.50	+1.8	+6.5
O	PROGRAMMING & SYS INC	11	6	6.38	+0.4	+4.2
O	REYNOLDS & REYNOLDS CO	42	25	32.75	-1.0	-3.0
O	SCIENTIFIC COMPUTERS INC	7	4	7.25	+1.3	+20.8
O	SEI CORP	38	16	22.00	+0.5	+2.3
O	SHARED MED SYS CORP	49	26	47.25	+2.0	+4.4
O	SOFTWARE AG SYSTEMS INC	22	10	13.13	-1.5	-10.3
O	SOFTWARE PUBG CORP	11	5	10.50	+2.1	+25.4
A	STERLING SOFTWARE INC	21	10	13.13	+0.8	+6.1
N	SUNGUARD DATA SYSTEMS	17	10	16.38	+1.1	+7.4
N	UCCEL CORP	33	15	30.25	+0.6	+3.0
N	URS CORP	16	11	17.88	+0.8	+4.4
O	VM SOFTWARE INC	32	12	29.50	+2.5	+6.3

SEMICONDUCTORS

EXCH		52 WEEK RANGE (1)		PRICE CLOSE JAN 21 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	34	13	17.50	-0.5	-2.8
N	ANALOG DEVICES INC	25	14	16.38	-1.3	-8.4
O	ANALOGIC CORP	15	10	10.75	-0.3	-2.3
N	APPLIED MAGNETICS CORP	20	13	16.13	+0.6	+4.1
O	AVANTEK INC	23	14	16.75	+0.0	+0.0
O	HADCO CORP	6	3	4.50	+0.0	+0.0
O	INTEL CORP	32	16	27.50	-0.4	-1.3
O	MICRO MASK INC	7	2	4.63	+0.1	+2.8
N	MOTOROLA INC	50	34	43.75	+0.3	+0.6
N	NATIONAL SEMICONDUCTOR	16	6	13.63	+0.3	+1.6
N	TERADYNE INC	30	16	16.88	+0.8	+3.6

PERIPHERALS & SUBSYSTEMS

EXCH		52 WEEK RANGE (1)		PRICE CLOSE JAN 21 1987	WEEK NET CHNGE	WEEK PCT CHNGE
4	AM INTL INC	8	6	7.25	+0.1	+1.8
4	ANDERSON JACOBSON INC	3	1	1.88	+0.6	+0.0
O	AST RESH INC	25	11	14.88	-1.4	-8.5
O	AUTOTROL CORP	10	5	8.50	+0.5	+6.3
O	AVANT GARDE COMPUTING	7	3	4.88	+0.0	+0.0
O	BANCTEC INC	13	6	10.75	-0.1	-1.1
N	BOLT BERANEK & NEWMAN	51	34	48.88	-1.1	-2.3
A	CETEC CORP	6	5	5.38	+0.1	+2.4
4	COGNITRONICS CORP	6	2	3.38	-0.1	-3.6
N	COMPUGRAPHIC CORP	27	16	21.50	+0.3	+1.2
N	COMPUTERVISION CORP	16	10	17.50	+1.6	+12.0
N	CONRAC CORP	16	12	13.75	+0.3	+1.6
A	DATAPRODUCTS CORP	16	11	14.25	+0.1	+0.6
A	DATARAM CORP	16	7	8.50	-0.1	-1.4
O	DATA SWITCH CORP	6	5	6.38	+0.8	+13.3
O	DATUM INC	7	4	5.25	-0.1	-2.3
N	DECISION INDS CORP	15	8	10.38	-0.5	-4.6
O	ENDATA INC	8	4	7.50	-0.8	-6.1
O	EMC CORP	25	11	23.50	+1.5	+6.6
O	EVANS & SUTHERLAND	31	16	30.25	-0.3	-0.8
N	FLOATING POINT SYS INC	46	11	12.25	-1.1	-8.4
O	GANDALF TECHNOLOGIES	6	5	6.13	+0.1	+1.6
N	GENERAL DATACOMM IND	15	6	6.25	+0.0	+0.0
N	HAZELTINE CORP	30	16	26.75	+0.0	+0.0
O	ICOT CORP	13	6	10.00	-0.1	-1.2
O	INFORMATION INTL INC	16	13	14.25	+0.3	+1.6
O	INTECOM INC	7	3	3.00	+0.0	+0.0
O	INTERLEAF INC	15	8	11.88	-0.6	-5.0
O	MEGADATA CORP	4	2	2.88	+0.0	+0.0
4	MSI DATA CORP	14	10	12.88	+0.6	+5.1
N	NASHUA CORP	26	15	26.25	+1.3	+5.0
O	NETWORK SYS CORP	18	10	17.00	+1.1	+7.1
N	NORTH AMERN PHILIPS CORP	48	35	44.63	+0.0	+0.0
N	NORTHERN TELECOM LTD	38	25	37.25	+2.1	+6.0
O	NOVELL INC	37	14	33.25	-1.3	-3.6
N	PARADYNE CORP	11	4	4.75	-0.1	-2.6
4	PENRIL CORP	6	4	4.25	-0.1	-2.6
N	PLESSEY PLC	38	23	26.50	+0.8	+2.6
O	PRINTRONIX INC	15	10	10.63	+0.6	+6.3
O	QMS INC	16	10	10.13	+0.0	+0.0
O	RAMTEK CORP	7	3	5.50	+0.1	+2.3
N	RECOGNITION EQUIP INC	20	10	18.50	-0.6	-3.6
O	SCAN TRON CORP	16	11	16.25	-0.6	-4.4
N	SCIENTIFIC ATLANTA INC	15	6	13.13	+0.1	+1.0
O	SEAGATE TECHNOLOGY	30	6	38.63	+2.5	+9.6
N	STORAGE TECHNOLOGY	7	2	4.13	+0.4	+10.6
O	SUN MICROSYSTEM INC	32	11	25.50	+1.5	+5.6
4	T BAR INC	8	5	7.88	-0.3	-3.1
4	TAB PRODS CO	16	12	16.00	+0.0	+0.0
O	TANDON CORP	6	2	2.75	-0.3	-8.3
4	TEC INC	7	3	3.50	+0.0	+0.0
N	TEKTRONIX INC	60	55	76.75	-0.3	-0.3
O	TELEVIDEO SYS INC	4	2	2.75	-0.1	-4.6
N	TELLA CORP	84	52	78.63	+1.6	+2.3
N	TIMEPLEX INC	33	14	31.50	-3.3	-11.5
N	TITAN CORP	12	6	6.25	-0.0	+0.0
O	VISUAL TECHNOLOGY INC	1	0	0.44	+0.0	+0.0
O	WYSE TECH	24	11	23.63	-3.3	-16.0

LEASING COMPANIES

EXCH		52 WEEK RANGE (1)		PRICE CLOSE JAN 21 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	26	15	21.13	+1.1	+5.8
N	CONTINENTAL INFO SYS	12	7	8.75	+0.1	+1.3
O	FINALCO GROUP INC	5	2	3.63	-0.2	-5.4
O	PHOENIX AMERN INC	6	3	5.38	+0.3	+4.6
O	SELECTERM INC	12	5	5.56	+0.1	+1.1
N	U S LEASING	47	38	44.75	-1.3	-2.7

EXCH: N = NEW YORK, 4 = AMERICAN; P = PACIFIC; B = BOSTON; L = NATIONAL; M = MIDWEST; O = OVER THE-COUNTER; S = SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID

(1) TO NEAREST DOLLAR

COMPUTER INDUSTRY

INSIDE

Analysts foresee a new industry of third-party PC software support firms/67

Apple, Microsoft, Tandy report solid quarterly growth, but NCR stalls/72

Sytek to broaden its horizons, support Ethernet, TCP/IP/74

HP cofounder William Hewlett retires/92

INSTANT ANALYSIS

"IBM's situation is like General Motors Corp.'s. They overexpanded their fixed assets when demand peaked, they are heavily oriented toward large systems — instead of large cars — and they have lost market share to a leaner competitor."

— **Thomas Rooney, analyst with Donaldson, Lufkin & Jenrette**

Wang, Unisys post losses

But most hardware firms report strong fourth quarter

By Clinton Wilder

Major losses at Unisys Corp. and Wang Laboratories, Inc. marred a generally positive spectrum of fourth-quarter financial results announced by major hardware vendors last week (see chart below).

Amdahl Corp. reported one of its most successful recent quarters as profit more than doubled on a strong rise in revenue. Harris Corp.'s earnings rose 39%, while Sun Microsystems, Inc. said profits increased more than fourfold. But Data General Corp. continued to struggle, eking out a tiny $356,000 operating profit on a modest revenue increase, and Prime Computer, Inc. reported a 19% drop in profits for the quarter.

Unisys. As announced earlier, the merged Burroughs Corp. and Sperry Corp. reported a substantial loss because of charges from merger-related asset sales, write-downs, plant consolidations and work force reductions. Unisys took a charge of $280 million, or $6.08 per share, causing a net loss of $188.5 million, or $4.68 per share.

For the year, the Detroit-based firm posted a loss of $43.4 million, or $1.63 per share, on revenue of $7.4 billion.

Chairman W. Michael Blumenthal said Unisys revenue and orders will grow less than 10% this year but that earnings should be strong because of cost savings.

Wang. The Lowell, Mass., office automation vendor reported a larger than expected $78.6 million loss, equal to 49 cents per share, on revenue that declined slightly to $668.9 million. The loss included $37 million in charges from the recently announced layoffs and inventory write-downs.

The company had said the loss would be greater than the $30 million deficit of the previous quarter, but its size surprised analysts. "They don't seem to have a handle on how much it costs to sell in today's environment," said John McCarthy of Forrester Research, Inc. in Cambridge, Mass.

Amdahl. The Sunnyvale, Calif., IBM-compatible mainframe seller reported profits of $29.5 million, or 60 cents per share — which included five cents of ex-

See WANG page 92

Enmasse pulls operations plug

By Stanley Gibson

ACTON, Mass. — One day before it was scheduled to unveil a new line of computers at Uniforum 1987, The International Conference of Unix Users, Enmasse Computer Corp. announced last week that it has abandoned manufacturing and sales operations.

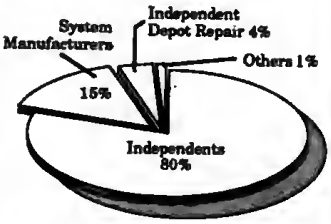
Robert Gardner, president of the start-up maker of Unix-based multiprocessors, said the denial of a last-minute request for an additional $5 million in venture capital prompted the surprise announcement. En-

See ENMASSE page 92

Data View

U.S. third-party maintenance

Shares of $1.56 billion market in 1986



INFORMATION PROVIDED BY INPUT

INDUSTRY INSIGHT
Bob Djurdjevic

DEC takes slice of Big Blue pie

The market share trends that started in 1985 continued in the first half of last year. Digital Equipment Corp.'s share of the intermediate systems market went up while IBM's was down. Perhaps that is why 1986 may be remembered as the year in which IBM, reacting to DEC, rained down on its competition the greatest number of mid-range system announcements in its corporate history.

The highlight of the first half of 1986 was the June announcements, when IBM aimed a flurry of some 125 new products in DEC's direction. But it was on Oct. 7 that IBM unveiled its most potent anti-DEC weapon — the 9370, also dubbed "the VAX killer."

Based on a July 1986 report from Computer Intelligence Corp., one can try to quantify the degree to which DEC has made inroads into IBM's intermediate systems territory.

DEC's market share gain in terms of the "if sold" value of its *shipments* in the first half of 1986 is especially impressive. DEC's share of shipment list value went up from 23% to 41%, while IBM's declined from 52% to 29%.

DEC's share of the U.S. installed base's "if sold" value at list increased from 28% to 30% during the same period. Market shares of most other intermediate systems vendors have not

See DEC page 74

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

Software earnings climb

Computer Associates leads with 90% increase

By James A. Martin

Analysts' predictions that this will be a relatively healthy year for the software and services industries were boosted by last week's quarterly earnings reports from several major vendors, reflecting net income increases of as much as 90%.

Computer Associates International, Inc. led the way, reporting third-quarter revenue of $93.6 million, an increase of 56% from $60.1 million for the same period last year. The IBM mainframe software vendor also reported that net income increased 90% to $16.4 million, or 66 cents per share, from $8.6 million, or 39 cents per share.

The Garden City, N.Y.-based developer's results were the most surprising of last week's reports, according to Terence Quinn, senior technology analyst for E. F. Hutton & Co. "They had been forecasting growth of about 30% to 35%, but their actual growth has been much larger," he said.

Analysts and Computer Associates officials agreed that the company's recent acquisitions, including Software International Corp., have contributed to the health of the company. But Anthony W. Wang, Computer Associates' president, noted that even without the acquisitions, revenue grew by more than 40%.

The software industry hit its low point in late 1985 and has been slowly rebounding since, according to Paul Bloom, software analyst with Johnson Lane Space Smith & Co. in Atlanta. "Buyers struggled for a while with what they were going to do with less money. Eventually,

See SOFTWARE page 92

1986 fourth-quarter earnings

With the notable exceptions of IBM, Wang Laboratories and Data General, results were generally positive across the industry

Company	Net Income Oct.-Dec. (thousands of dollars)	Percent Change From 1985	Revenue Oct.-Dec. (thousands of dollars)	Percent Change From 1985
Amdahl	29,583	+116	336,777	+31
Apple	58,500	+3	662,300	+24
Computer Associates	16,400	+90	93,600	+56
DG	356[1]	-68	313,300	+7
Harris	20,125	+39	534,533	-5
IBM	1,390,000	-48	16,945,000	-1
NCR	134,000	+4	1,500,000	+12
Stratus	3,700	+52	35,300	+40
Sun Microsystems	8,515	+405	115,375	+173
Tandem	27,000	+133	238,000	+40
Wang	(78,600)	—	668,900	-10

Parentheses indicate loss
[1]Excludes $3 million extraordinary tax credit

CW CHART

MORE THAN JUST THE BASIC NECESSITIES

KEYFAST

ONLINE · DATA · ENTRY

THE MOST INSTALLED ONLINE DATA ENTRY SYSTEM WORLDWIDE

Cutting costs. Cutting response time. Without cutting quality. KEYFAST, the CICS Data Entry System, saves the user time and money. It doubles data entry productivity and gives users the most complete set of data editing routines available. Its Data Dictionary makes many commonly needed user exits unnecessary. The LANGUAGE, H&M's powerful end user programming language, enables users to define special field validations. KEYFAST is easy to install and can be used immediately. KEYFAST is simple. It allows non-expert users to paint complex formats and editing rules online. It guides users with multilingual menus, Help Screens with notepads, messages and message explanations. KEYFAST's flexibility provides comprehensive checks: alphanumeric, numeric, binary, packed and entry/verify fields, range checks, table lookup; search, mass change, select, merge, copy and sort functions. KEYFAST is powerful: automatic field duplication, shorthand, mathematical functions and totals for data management; extensive batch processing; data extract on any storage media, select, duplicate, modify, extend or reformat records. KEYFAST offers password, application, task, function and batch security.

H&M SOFTWARE'S FUTURE

H&M Systems Software, Inc., 25 E. Spring Valley Avenue
Maywood, N.J. 07607-9982, Phone: 1-(201) 845-3357
TOLL FREE: 1-(800) FOR DEMO

MAIL FOR MORE INFORMATION

Name

Company

Department

Street

City, State, Zip

CPU Op System

H&M Systems Software, Inc., 25 E Spring Valley Ave
Maywood, N.J 07607-9982, Phone 1-(201) 845-3357

YOU CAN'T DEVELOP THE WORLD'S BEST SOFTWARE ON THIS.

Fifteen years ago, the typical business software vendor worked with an R&D budget that could just about lace up his sneakers.

That's because the head of R&D was also the president and the night watchman. And his only product was a hot accounting package – a general ledger or fixed asset system.

As one of the companies that did, in fact, start out that way and ended up on top, we can tell you something about shoestring budgets and single package technology. They may be the things that got us on the map, but they aren't what made us grow into the McCormack & Dodge of today. A global company offering advanced application software to support a multiplicity of needs. As well as a complete set of tools to help end users get more out of every package.

The most important of these is Millennium: SDT, a systems development tool that lets our users design applications on-line in the same borderless environment we work in at M&D. On all the major databases, including DB2.

Such leadership products are not created out of thin air. They come out of well-funded R&D teams, supported by Dun & Bradstreet resources.

These days, instead of developing applications on a shoestring, we develop them on Millennium: SDT. May we suggest you do the same?

McCormack & Dodge

a company of The Dun & Bradstreet Corporation

Financial, human resource, manufacturing and application development software for mainframe and minicomputer environments. Call 1-800-343-0325.